APT85GR120JD60

1200V, 85A, $V_{ce(on)}$ = 2.5V Typical

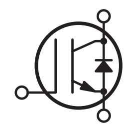
Ultra Fast NPT - IGBT®

ISOTOP®
Combi (IGBT and Diode)

The Ultra Fast NPT - IGBT® family of products is the newest generation of planar IGBTs optimized for outstanding ruggedness and the best trade-off between conduction and switching losses.

Features

- **Low Saturation Voltage**
- **Low Tail Current**
- **RoHS Compliant**
- **Short Circuit Withstand Rated**
- **High Frequency Switching**
- **Ultra Low Leakage Current**



Unless stated otherwise, Microsemi discrete IGBTs contain a single IGBT die. This device is recommended for applications such as induction heating (IH), motor control, general purpose inverters and uninterruptible power supplies (UPS).

MAXIMUM RATINGS

All Ratings: T_C = 25°C unless otherwise specified.

Symbol	Parameter	Ratings	Unit
V_{ces}	Collector Emitter Voltage	1200	V
V_{GE}	Gate-Emitter Voltage	±30	
I_{C1}	Continuous Collector Current @ T_C = 25°C	118	A
I_{C2}	Continuous Collector Current @ T_C = 75°C	85	
I_{CM}	Pulsed Collector Current ①	340	
SCWT	Short Circuit Withstand Time: V_{CE} = 600V, V_{GE} = 15V, T_C=125°C	10	µs
P_D	Total Power Dissipation @ T_C = 25°C	595	W
T_J,T_{STG}	Operating and Storage Junction Temperature Range	-55 to 150	°C
T_L	Max. Lead Temp. for Soldering: 0.063" from Case for 10 Sec.	300	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Min	Typ	Max	Unit
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage (V_{GE} = 0V, I_C = 1.0mA)	1200			Volts
$V_{GE(TH)}$	Gate Threshold Voltage (V_{CE} = V_{GE}, I_C = 2.5mA, T_j = 25°C)	3.5	5.0	6.5	
$V_{CE(ON)}$	Collector-Emitter On Voltage (V_{GE} = 15V, I_C = 85A, T_j = 25°C)		2.5	3.2	
	Collector-Emitter On Voltage (V_{GE} = 15V, I_C = 85A, T_j = 125°C)		3.3		
	Collector-Emitter On Voltage (V_{GE} = 15V, I_C = 170A, T_j = 25°C)		3.5		
I_{CES}	Collector Cut-off Current (V_{CE} = 1200V, V_{GE} = 0V, T_j = 25°C) ②		20	1100	µA
	Collector Cut-off Current (V_{CE} = 1200V, V_{GE} = 0V, T_j = 125°C) ②		200		
I_{GES}	Gate-Emitter Leakage Current (V_{GE} = ±20V)			±250	nA

CAUTION: These Devices are Sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

052-6404 Rev B 3-2013

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	Capacitance		8400		pF
C_{oes}	Output Capacitance	V_{GE} = 0V, V_{CE} = 25V		725		
C_{res}	Reverse Transfer Capacitance	f = 1MHz		190		
V_{GEP}	Gate to Emitter Plateau Voltage	Gate Charge		7.5		V
Q_g (3)	Total Gate Charge	V_{GE} = 15V		490	660	nC
Q_{ge}	Gate-Emitter Charge	V_{CE}= 600V		60	85	
Q_{gc}	Gate- Collector Charge	I_C = 85A		230	320	
$t_{d(on)}$	Turn-On Delay Time	Inductive Switching (25°C)		43		ns
t_r	Current Rise Time	V_{CC} = 600V		70		
$t_{d(off)}$	Turn-Off Delay Time	V_{GE} = 15V		300		
t_f	Current Fall Time	I_C = 85A		85		
E_{on2} (5)	Turn-On Switching Energy	R_G = 4.3 Ω (4)		6000	9000	μJ
E_{off} (6)	Turn-Off Switching Energy	T_J = +25°C		3800	5700	
$t_{d(on)}$	Turn-On Delay Time	Inductive Switching (125°C)		43		ns
t_r	Current Rise Time	V_{CC} = 600V		70		
$t_{d(off)}$	Turn-Off Delay Time	V_{GE} = 15V		350		
t_f	Current Fall Time	I_C = 85A		95		
E_{on2} (5)	Turn-On Switching Energy	R_G = 4.3 Ω (4)		7800	11,700	μJ
E_{off} (6)	Turn-Off Switching Energy	T_J = +125°C		4900	7350	

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction to Case Thermal Resistance (IGBT)	-	-	0.21	°C/W
$R_{\theta JC}$	Junction to Case Thermal Resistance (Diode)	-	-	0.56	
W_T	Package Weight	-	1.03	-	oz
Torque	Terminals and Mounting Screws.	-	-	10	in·lbf
		-	-	1.1	N·m
$V_{Isolation}$	RMS Voltage (50-60Hz Sinusoidal Waveform from Terminals to Mounting Base for 1 Min.)	2500	-	-	Volts

1 Repetitive Rating: Pulse width and case temperature limited by maximum junction temperature.
2 Pulse test: Pulse Width < 380μs, duty cycle < 2%.
3 See Mil-Std-750 Method 3471.
4 R_G is external gate resistance, not including internal gate resistance or gate driver impedance. (MIC4452)
5 E_{on2} is the energy loss at turn-on and includes the charge stored in the freewheeling diode.
6 E_{off} is the clamped inductive turn-off energy measured in accordance with JEDEC standard JESD24-1.
Microsemi reserves the right to change, without notice, the specifications and information contained herein.

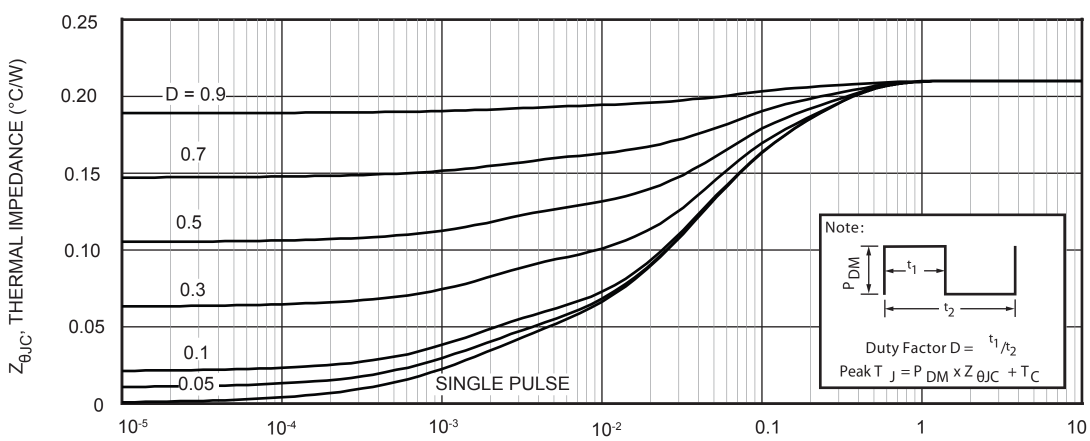


Figure 1, Maximum Effective Transient Thermal Impedance, Junction-To-Case vs Pulse Duration

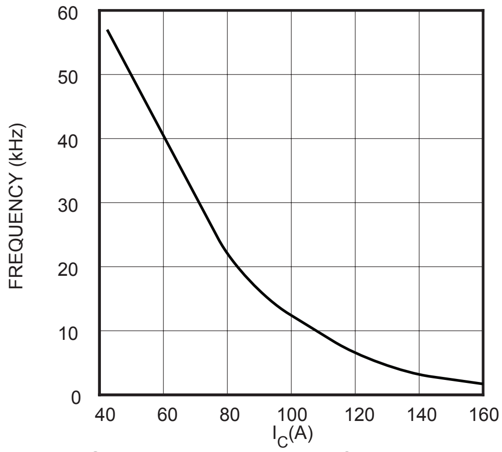


FIGURE 2, Max Frequency vs Current (T_{case} = 75°C)

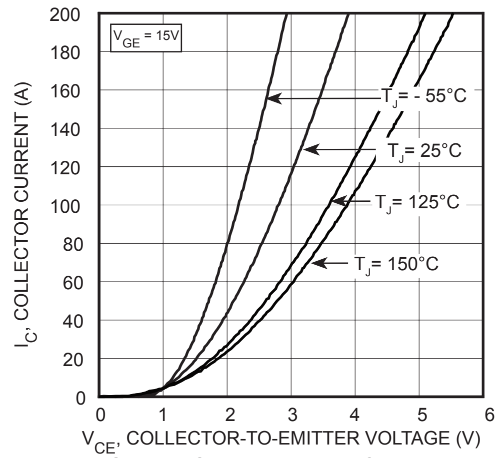


FIGURE 3, Saturation Voltage Characteristics

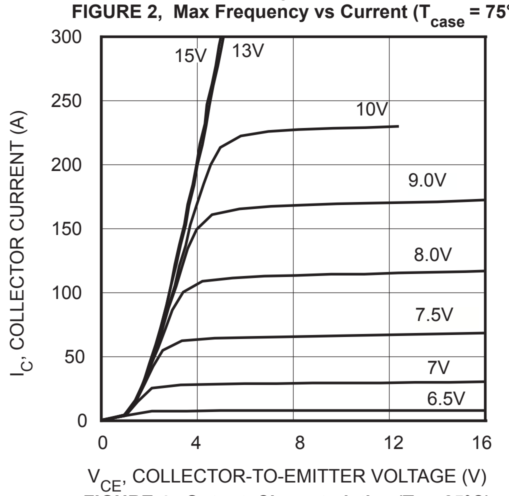


FIGURE 4, Output Characteristics (T_J = 25°C)

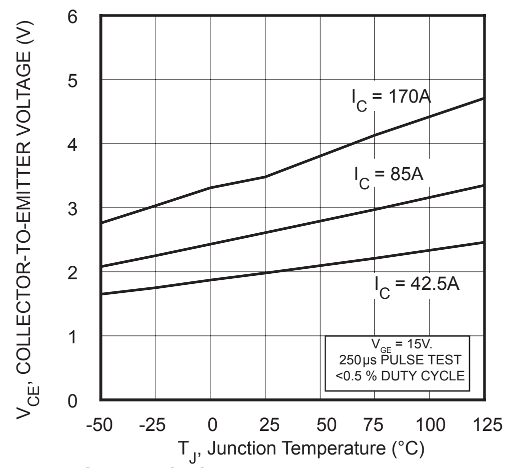


FIGURE 5, On State Voltage vs Junction Temperature

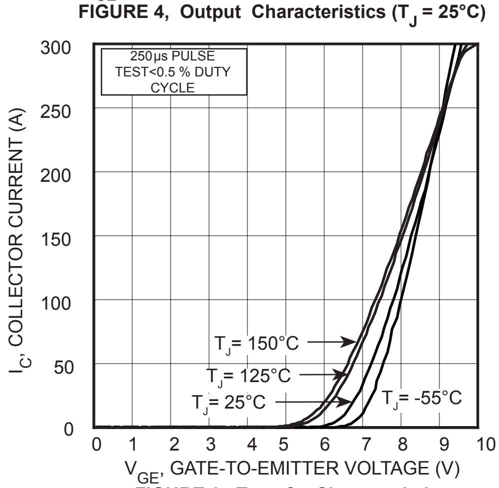


FIGURE 6, Transfer Characteristics

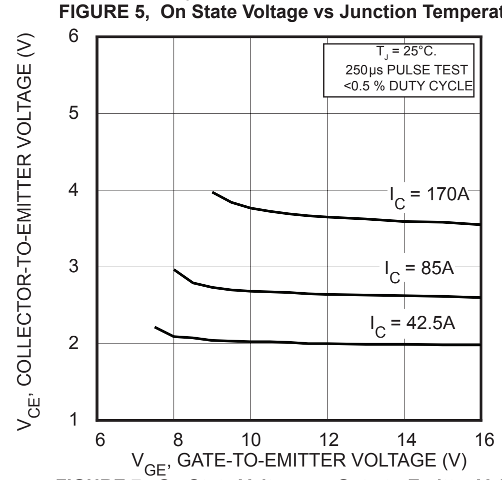


FIGURE 7, On State Voltage vs Gate-to-Emitter Voltage

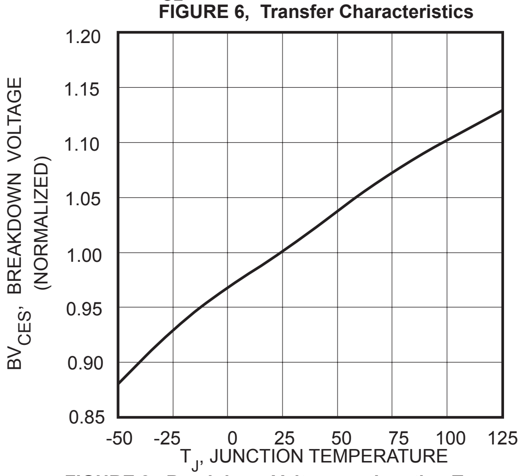


FIGURE 8, Breakdown Voltage vs Junction Temperature

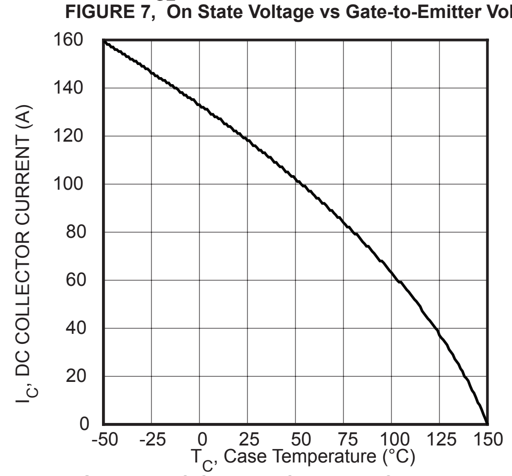


FIGURE 9, DC Collector Current vs Case Temperature

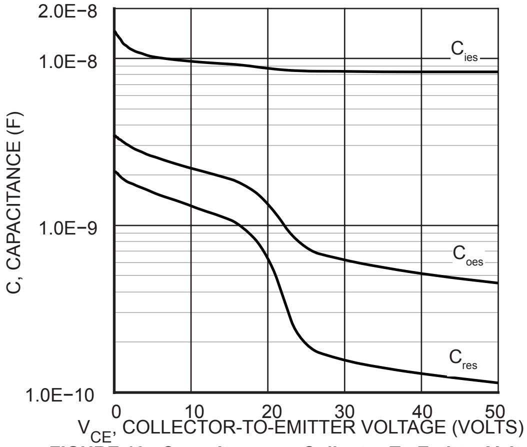


FIGURE 10, Capacitance vs Collector-To-Emitter Voltage

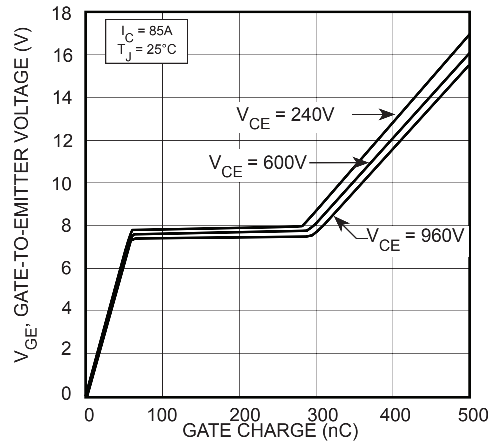


FIGURE 11, Gate charge

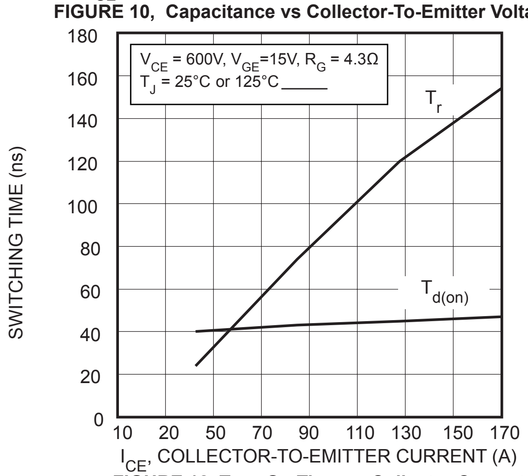


FIGURE 12, Turn-On Time vs Collector Current

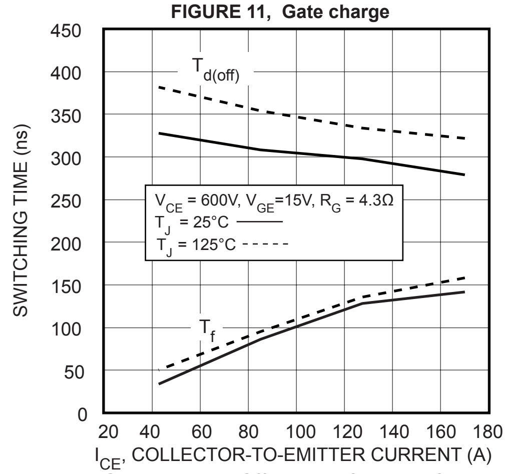


FIGURE 13, Turn-Off Time vs Collector Current

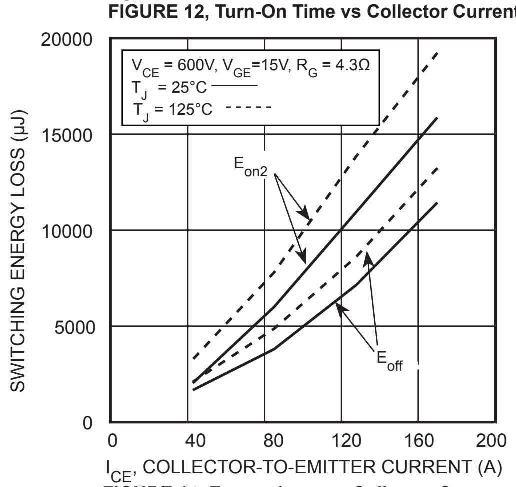


FIGURE 14, Energy Loss vs Collector Current

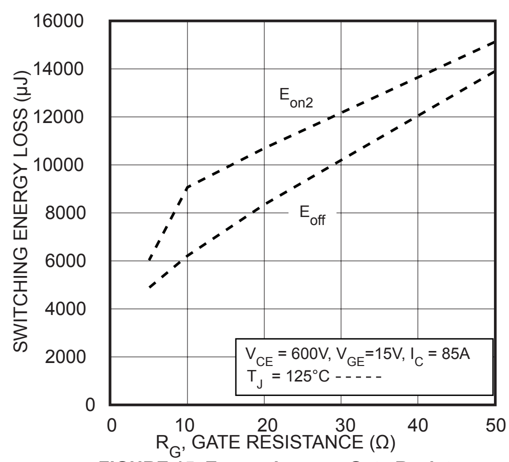


FIGURE 15, Energy Loss vs Gate Resistance

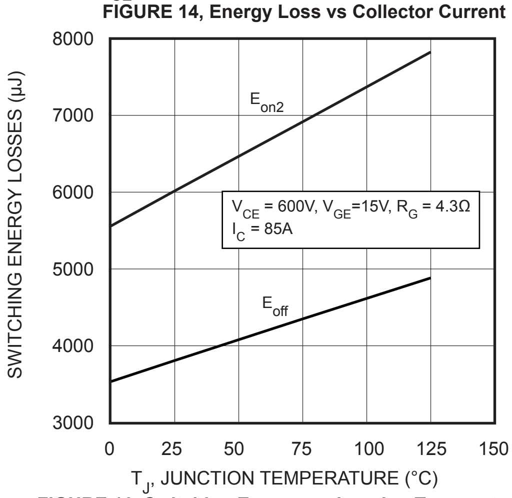


FIGURE 16, Switching Energy vs Junction Temperature

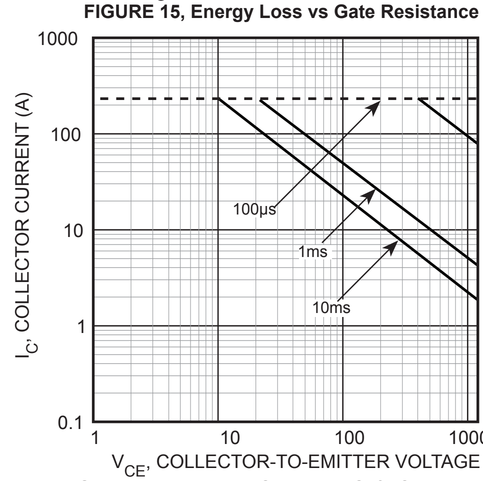


FIGURE 17, Minimum Switching Safe Operating Area

ULTRAFAST SOFT RECOVERY RECTIFIER DIODE

MAXIMUM RATINGS

All Ratings: T_C = 25°C unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT85GR120JD60	Unit
$I_{F(AV)}$	Maximum Average Forward Current (T_C = 92°C, Duty Cycle = 0.5)	60	Amps
$I_{F(RMS)}$	RMS Forward Current (Square wave, 50% duty)	73	Amps
I_{FSM}	Non-Repetitive Forward Surge Current (T_J = 45°C, 8.3 ms)	540	Amps

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions		Min	Type	Max	Unit
V_F	Forward Voltage	I_F = 60A		2.5		Volts
		I_F = 120A		3.07		
		I_F = 60A, T_J = 125°C		1.82		

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
t_{rr}	Reverse Recovery Time	I_F = 1A, di_F/dt = -100A/μs, V_R = 30V, T_J = 25°C	-	60	-	ns
t_{rr}	Reverse Recovery Time	I_F = 60A, di_F/dt = -200A/μs V_R = 800V, T_C = 25°C	-	265	-	ns
Q_{rr}	Reverse Recovery Charge		-	560	-	nC
I_{RRM}	Maximum Reverse Recovery Current		-	5	-	Amps
t_{rr}	Reverse Recovery Time	I_F = 60A, di_F/dt = -200A/μs V_R = 800V, T_C = 125°C	-	350	-	ns
Q_{rr}	Reverse Recovery Charge		-	2890	-	nC
I_{RRM}	Maximum Reverse Recovery Current		-	13	-	Amps
t_{rr}	Reverse Recovery Time	I_F = 60A, di_F/dt = -1000A/μs V_R = 800V, T_C = 125°C	-	150	-	ns
Q_{rr}	Reverse Recovery Charge		-	4720	-	nC
I_{RRM}	Maximum Reverse Recovery Current		-	40	-	Amps

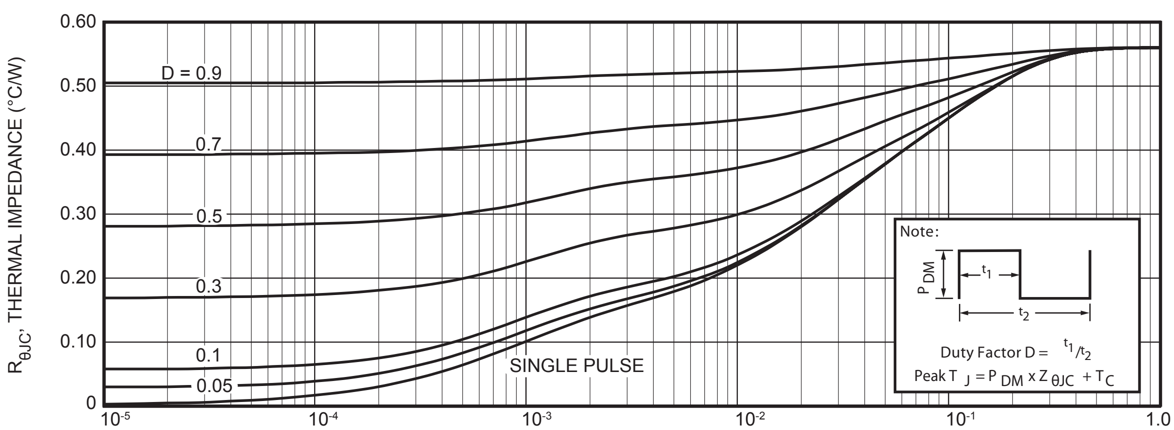


FIGURE 18. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

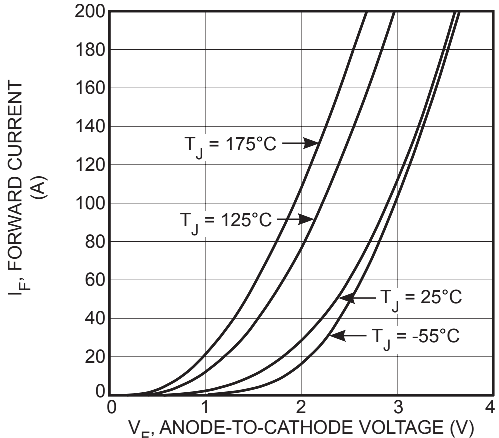


Figure 19. Forward Current vs. Forward Voltage

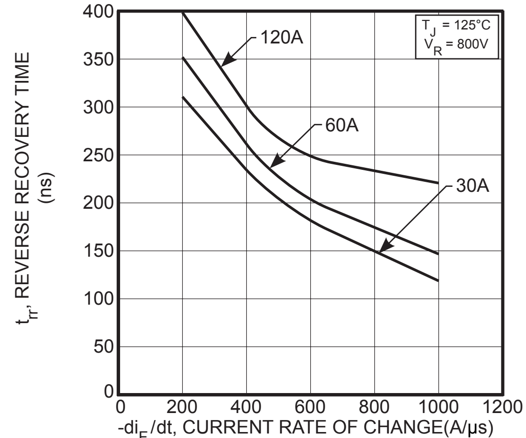


Figure 20. Reverse Recovery Time vs. Current Rate of Change

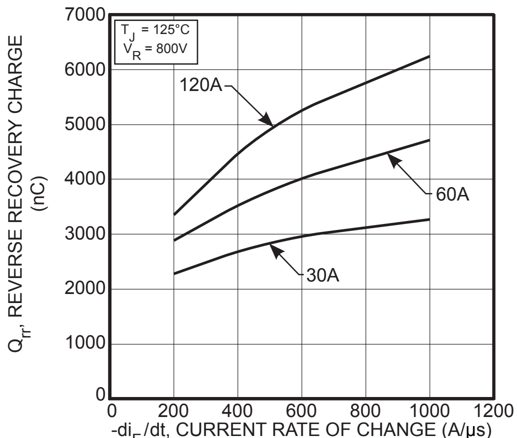


Figure 21. Reverse Recovery Charge vs. Current Rate of Change

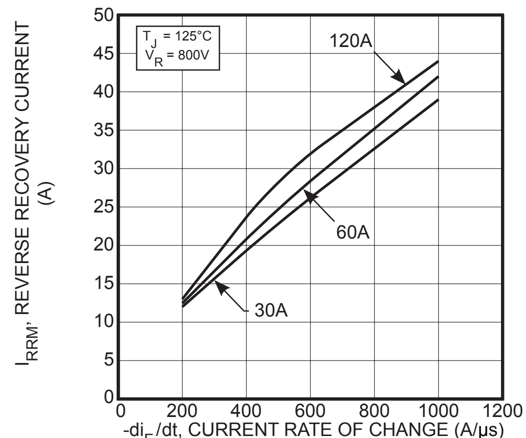


Figure 22. Reverse Recovery Current vs. Current Rate of Change

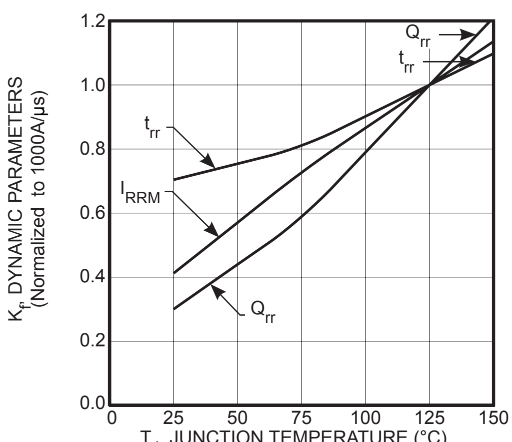


Figure 23. Dynamic Parameters vs. Junction Temperature

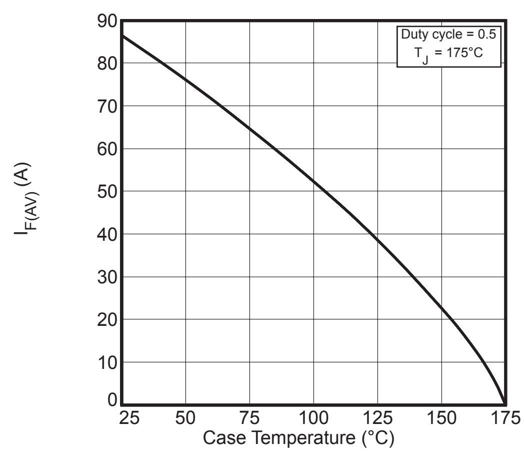


Figure 24. Maximum Average Forward Current vs. CaseTemperature

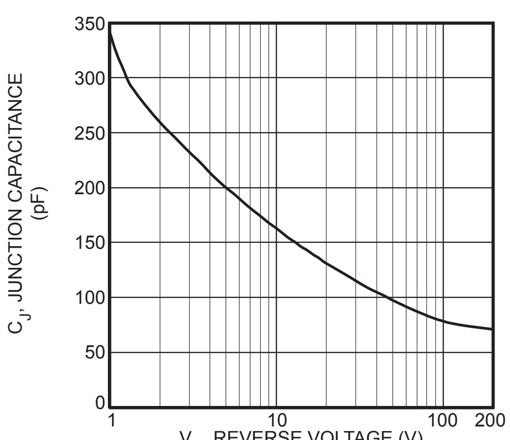


Figure 25. Junction Capacitance vs. Reverse Voltage

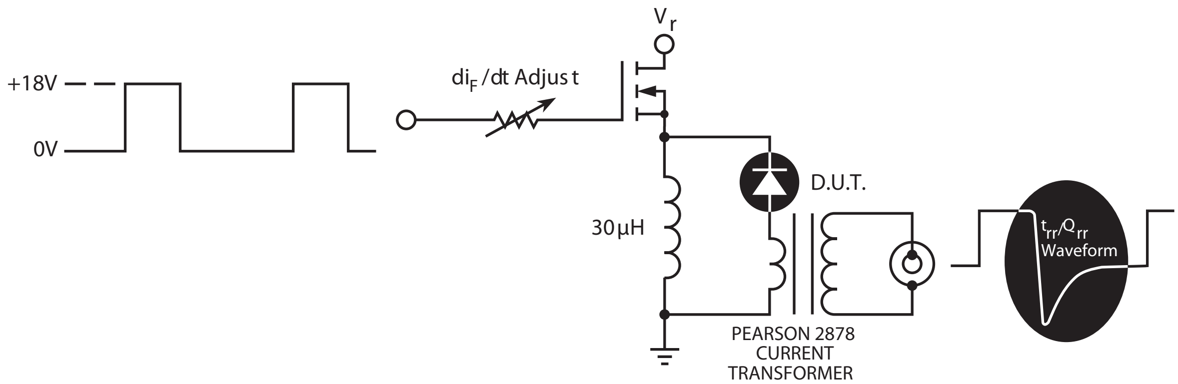


Figure 26. Diode Test Circuit

1. I_F - Forward Conduction Current
2. di_F/dt - Rate of Diode Current Change Through Zero Crossing.
3. I_{RRM} - Maximum Reverse Recovery Current
4. t_{rr} - Reverse Recovery Time measured from zero crossing where diode current goes from positive to negative, to the point at which the straight line through I_{RRM} and 0.25, I_{RRM} passes through zero.
5. Q_{rr} - Area Under the Curve Defined by I_{RRM} and $t_{RR.}$

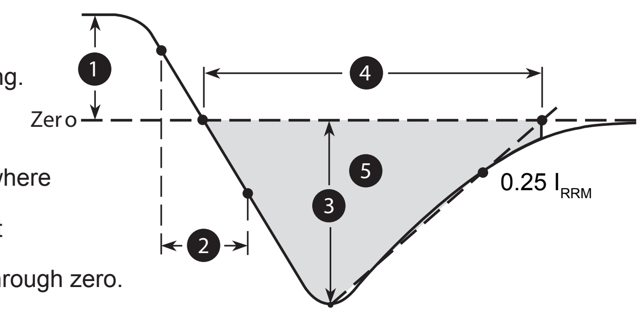
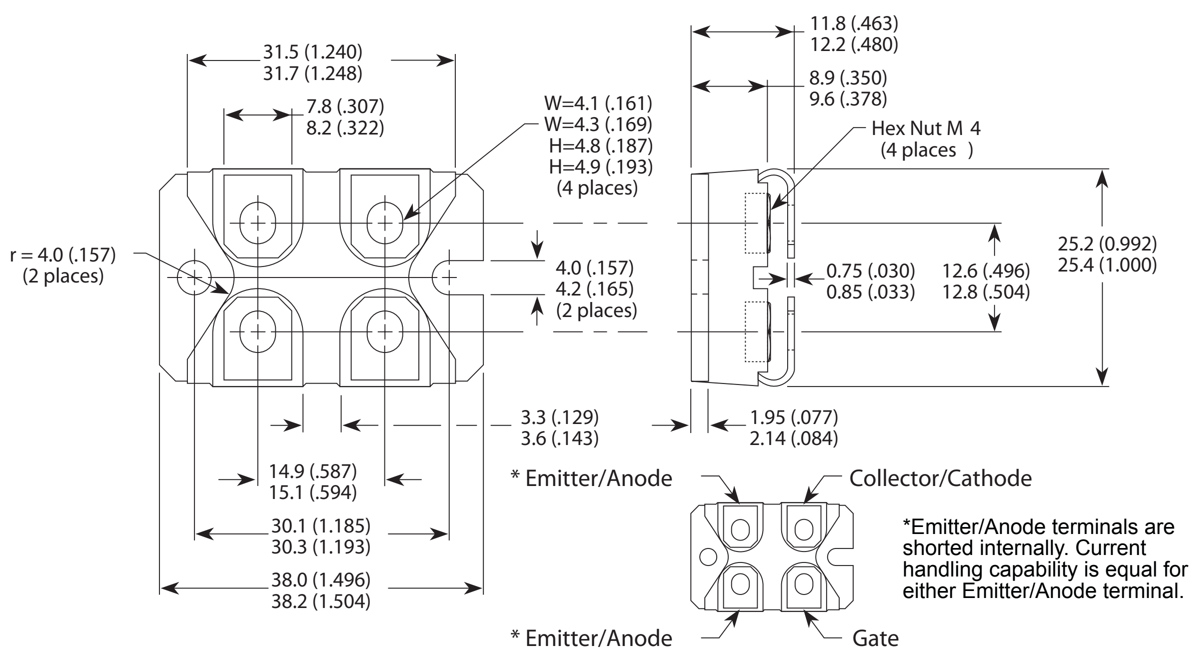


Figure 27. Diode Reverse Recovery Waveform Definition

SOT-227 (ISOTOP®) Package Outline



Dimensions in Millimeters and (Inches)

ООО "ЛайфЭлектроникс" "LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

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- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

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- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

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