

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412)925-7272

Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France(43) 72.75.15

Asymmetric Gate-Turn-Off Thyristors

300 Amperes/ 1200 & 1600 Volts

Description:

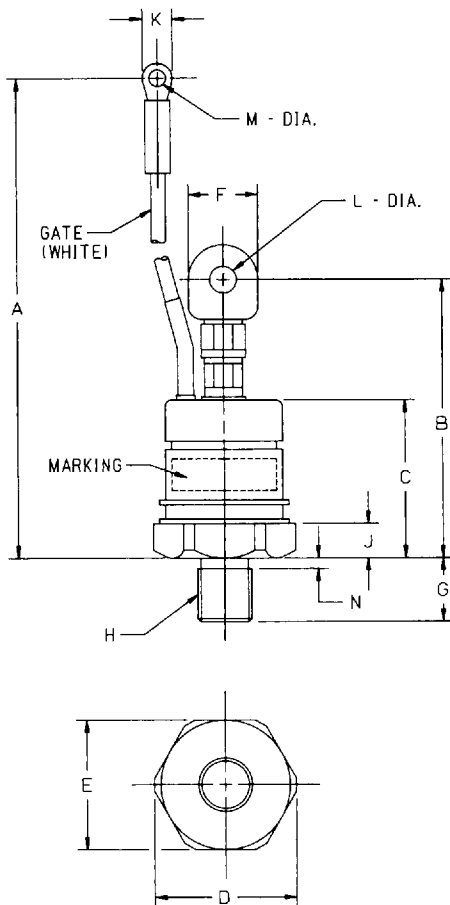
Powerex GTOs are designed for use in voltage-source inverter applications requiring fast switching GTOs with low snubber capacitances.

Features:

- Low Snubber Capacitance (1μF for 300A switch)
- Low On-State Voltage
- Low Switching Losses
- Fast Switching Time (t_{qs} = 15μS maximum)

Applications:

- Motor Control Inverters
- UPS Inverters
- Choppers
- Induction Heaters
- DC to DC Converters



DIM	INCHES	MILLIMETERS
A	8.1 ±.3	207 ±8
B	3.5 ±.2	88 ±6
C	1.97 MAX.	MAX. 50.0
D	1.77	45.0
E	1.61 ±.01/-0.02	41.0 ±0.2/-0.5
F	.87	22.0
G	.79 ±.02	20.0 ±0.5
H	M20 X 1.5	M20 X 1.5
J	.43 MAX	MAX 11.0
K	.37	9.5
L	.335 DIA.	DIA. 8.50
M	.209 DIA.	DIA. 5.30
N	.13 MAX	MAX 3.3

Ordering Information

Example: Select the complete nine digit device part number from the table below.

DEVICE	CURRENT RATING	MANU. NUMBER	TYPE	VOLTAGE RATING
GT	300	A	L	- 24 - 32
STUD TYPE GTO	I_{TORM} 300 A		ASYMMETRIC Low-Voltage	V_{DRM} 24=1200V 32=1600V

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GT300AL-24,32

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 Absolute Maximum Ratings, $T_j=25^{\circ}\text{C}$ unless otherwise specified

Characteristic	Symbol	GT300AL-24	GT300AL-32	Units
Repetitive Peak Reverse Voltage	V_{RRM}	15	15	Volts
Non-Repetitive Peak Reverse Voltage	V_{DRM}	15	15	Volts
DC Reverse Voltage	$V_{R(DC)}$	15	15	Volts
Repetitive Peak Off-State Voltage	V_{ORM}	1200	1600	Volts
Non-Repetitive Peak Off-State Voltage	V_{OSM}	1350	1700	Volts
DC Off-State Voltage	$V_{O(DC)}$	960	1280	Volts
Controllable On-State Current	$V_D=1/2V_{DRM}, T_j=125^{\circ}\text{C}, C_g=1.0\mu\text{F}, L_s=0.4\mu\text{H}, I_{GQ}=-60\text{A}$		I_{TGRM}	300 A
RMS On-State Current			$I_{T(RMS)}$	150 A
Average On-State Current	Sine-wave $\Theta=180^{\circ}, T_c=98^{\circ}\text{C}, f=60\text{ Hz}$		$I_{T(AV)}$	100 A
Surge On-State Current	NON-REP, One half cycle at 60Hz		I_{TSM}	2500 A
I^2t for Fusing	One half cycle at 60 Hz		I^2t	26,000 $\text{A}^2\text{-sec}$
Critical Rate of Rise of On-State Current	$V_D=1/2 V_{DRM}, I_{GM}=10\text{A}, T_j=125^{\circ}\text{C}$		di/dt	300 $\text{A}/\mu\text{S}$
Peak Gate Forward Current			I_{FGM}	30 A
Peak Gate Reverse Current			I_{RGM}	200 A
Peak Gate Forward Voltage			V_{FGM}	10 V
Peak Gate Reverse Voltage			V_{RGM}	15 V
Peak Gate Forward Power Dissipation			P_{FGM}	100 W
Peak Gate Reverse Power Dissipation			P_{RGM}	2000 W
Average Gate Forward Power Dissipation			$P_{FG(AV)}$	20 W
Average Gate Reverse Power Dissipation			$P_{RGA(V)}$	30 W
Junction Temperature			T_j	-40 TO +125 $^{\circ}\text{C}$
Storage Temperature			T_{stg}	-40 TO +150 $^{\circ}\text{C}$
Mounting Torque	RECOMMENDED VALUE 29.4 Nm or 21.6 ft lbs.			26.5 TO 35.3 Nm 19.4 TO 25.9 ft lbs.
Weight				385 grams

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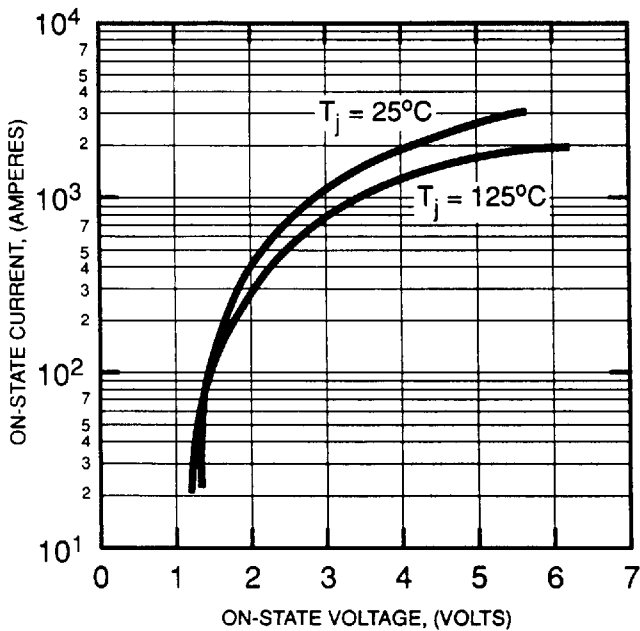
Electrical Characteristics, $T_j=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	$T_j=125^\circ\text{C}$, $V_R=V_{RRM}$	-----	-----	60.0	mA
Repetitive Peak Forward Leakage Current	I_{DRM}	$T_j=125^\circ\text{C}$, $V_D=V_{DRM}$, $V_{GK}=-2\text{V}$	-----	-----	30.0	mA
Gate Reverse Blocking Current	I_{RG}	$T_j=125^\circ\text{C}$, $V_{RG}=-15\text{V}$	-----	-----	60.0	mA
Peak On-State Voltage	V_{TM}	$T_j=125^\circ\text{C}$, $I_{TM}=300\text{A}$	-----	-----	2.1	V
Critical Rate of Rise of Off-State Voltage	dv/dt	$T_j=125^\circ\text{C}$, $V_D=50\% V_{DRM}$, $V_{GK}=-2\text{V}$	1000	-----	-----	V/ μS
Turn-Off Time	t_{off}	$I_{TM}=300\text{A}$, $T_j=125^\circ\text{C}$, $V_{RG}=15\text{V}$, $C_s=1.0\mu\text{F}$, $L_s=0.4\mu\text{H}$ $di_{oc}/dt=20\text{A}/\mu\text{s}$, $V_D=50\% V_{DRM}$	-----	-----	15	μs
Turn-On Time	t_{on}	$I_{TM}=300\text{A}$, $T_j=125^\circ\text{C}$, $I_{GK}=10\text{A}$, $V_D=V_{DRM}$	-----	-----	10	μs
Gate Trigger Current	I_{GT}	$V_D=5\text{V TO } 20\text{V}$, $I_T=25\text{A TO } 200\text{A}$	-----	-----	700	mA
Gate Trigger Voltage	V_{GT}	$V_D=5\text{V TO } 20\text{V}$, $I_T=25\text{A TO } 200\text{A}$	-----	-----	1.5	V

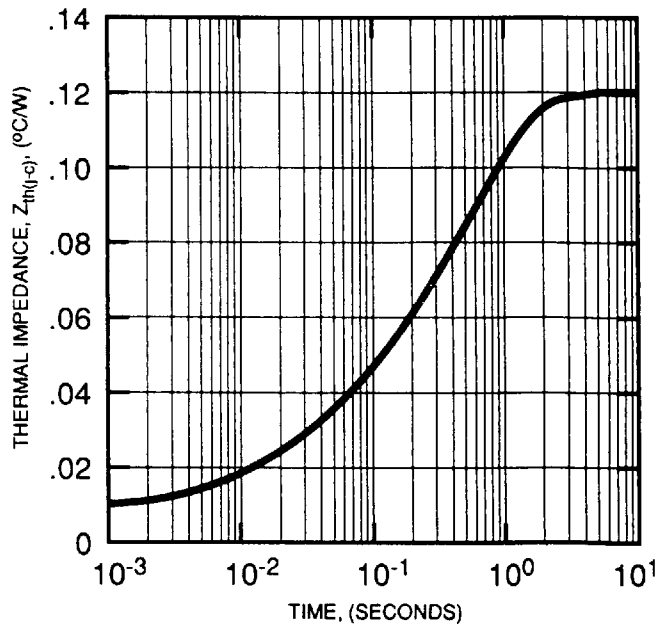
Thermal Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Units
Thermal Resistance Junction to Case	$R_{\theta jc}$	-----	-----	0.120	$^\circ\text{C/W}$
Thermal Resistance Case to Sink	$R_{\theta cs}$	-----	-----	0.040	$^\circ\text{C/W}$

MAXIMUM ON-STATE CHARACTERISTIC



TRANSIENT THERMAL IMPEDANCE CHARACTERISTIC, (JUNCTION TO CASE)



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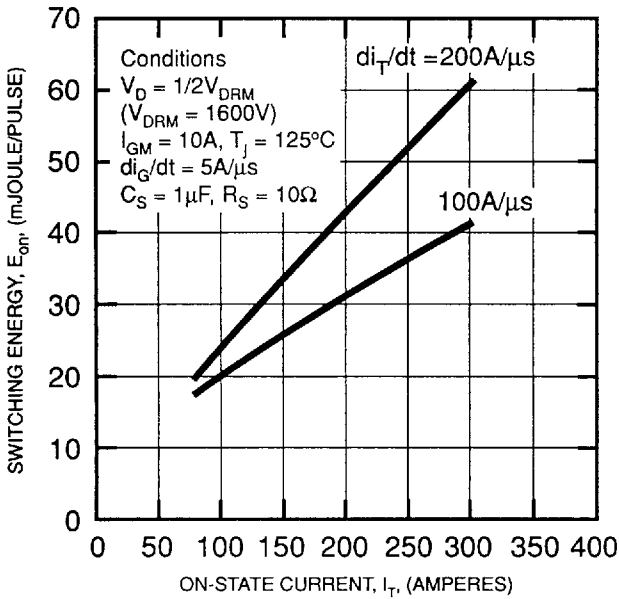
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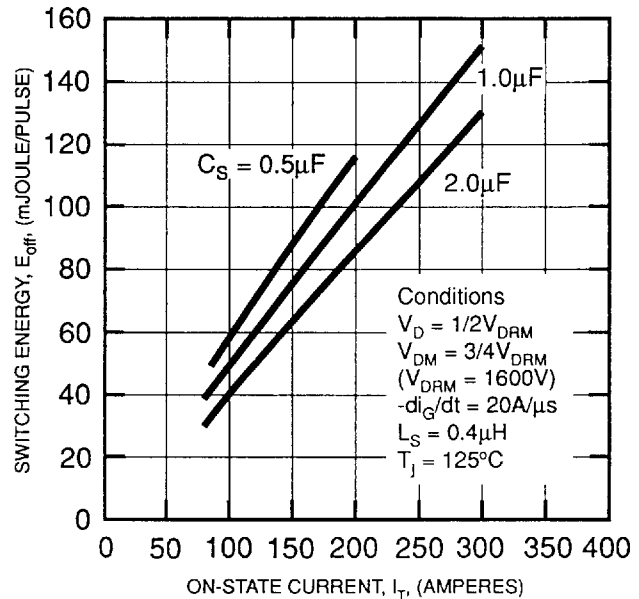
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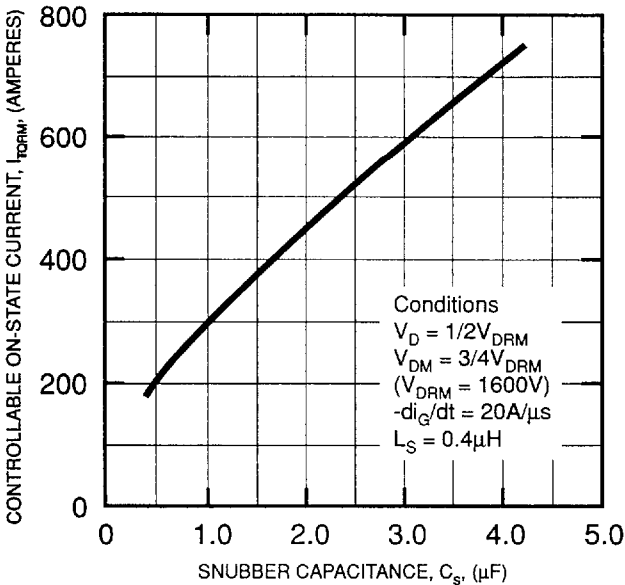
MAXIMUM TURN-ON SWITCHING ENERGY DISSIPATION PER PULSE



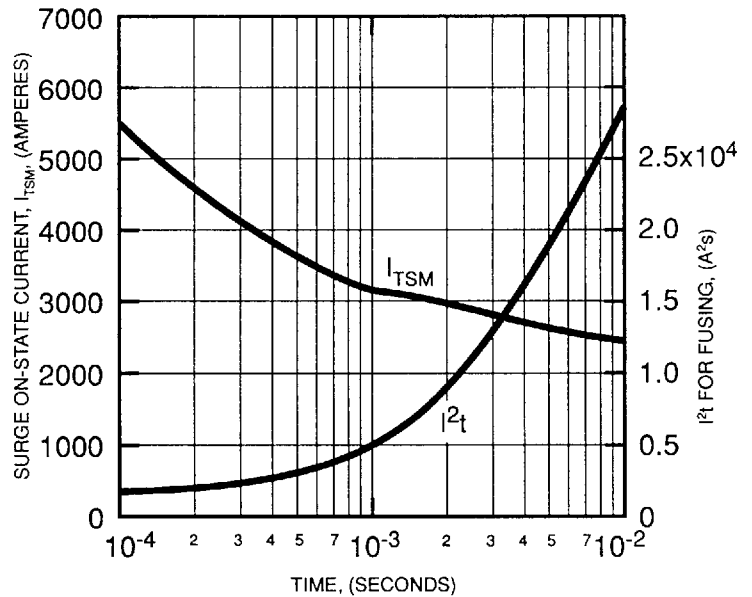
MAXIMUM TURN-OFF SWITCHING ENERGY DISSIPATION PER PULSE



MAXIMUM CONTROLLABLE ON-STATE CURRENT VS. SNUBBER CAPACITANCE



PEAK ONE-CYCLE ON-STATE SURGE CURRENT AND I²t





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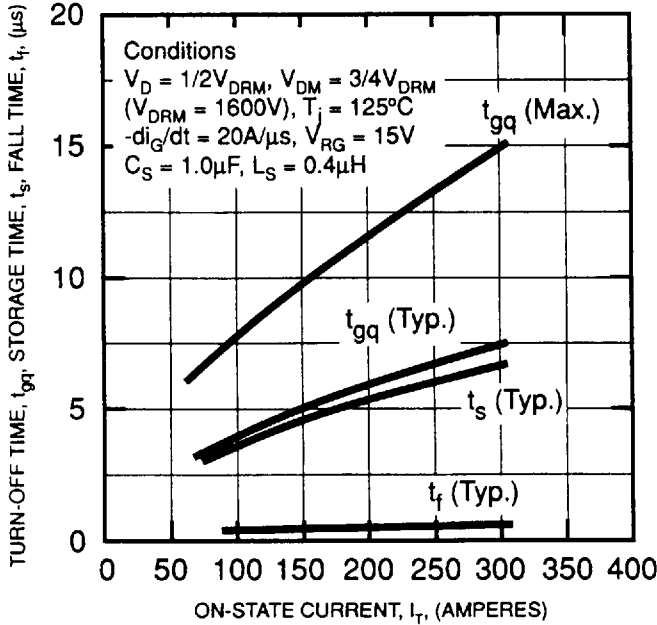
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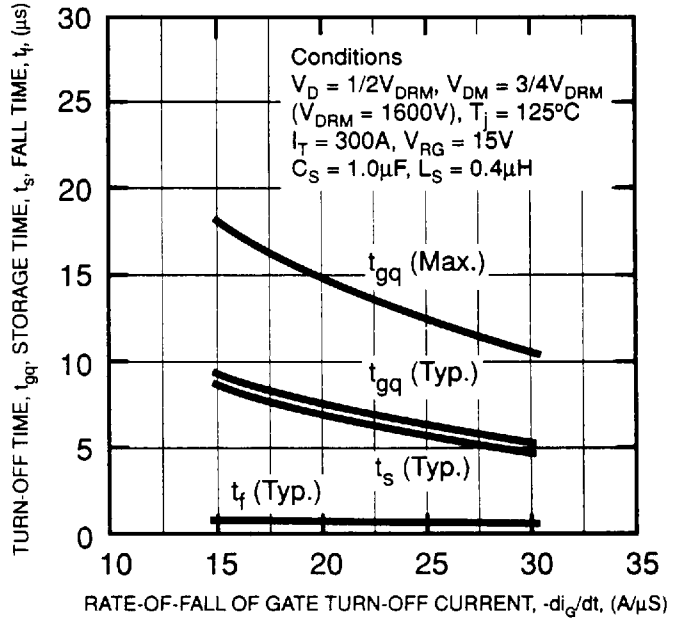
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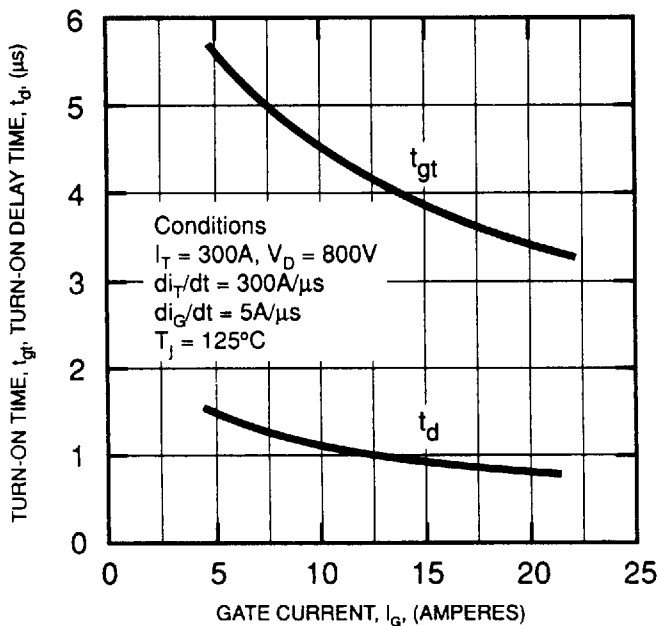
TURN-OFF TIME, STORAGE TIME, FALL TIME VS. ON-STATE CURRENT



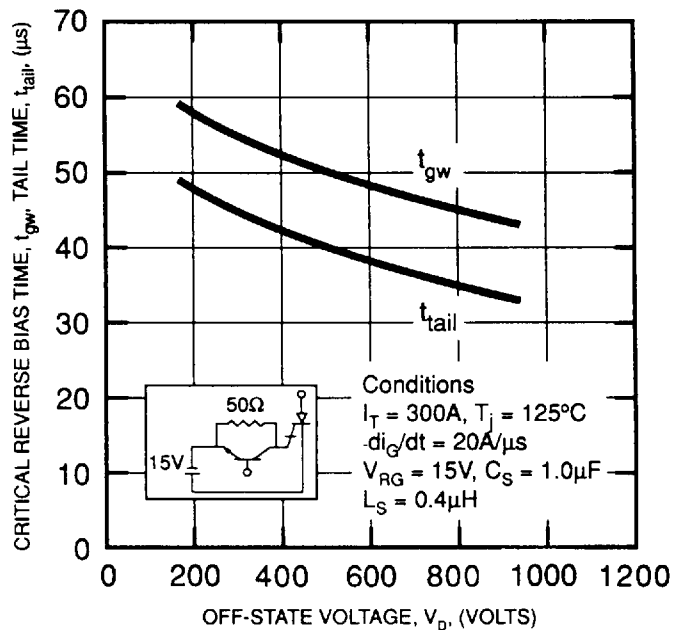
TURN-OFF TIME, STORAGE TIME, FALL TIME VS. RATE-OF-FALL OF GATE TURN-OFF CURRENT



TYPICAL TURN-ON TIME, TURN-ON DELAY TIME VS. GATE CURRENT



MAXIMUM CRITICAL REVERSE BIAS TIME, TAIL TIME VS. OFF-STATE VOLTAGE





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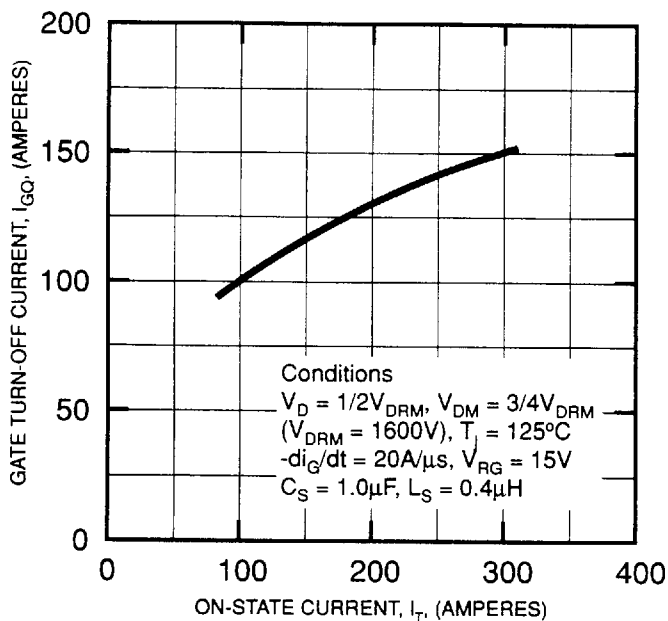
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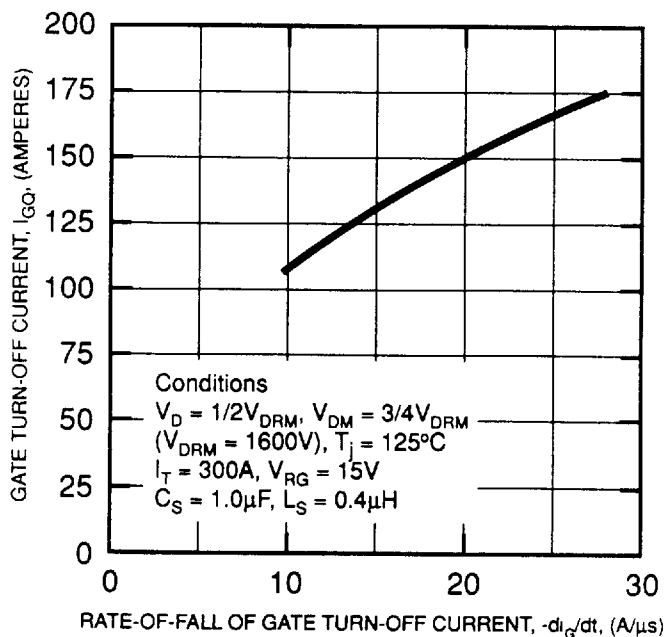
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MAXIMUM GATE TURN-OFF CURRENT VS. ON-STATE CURRENT



MAXIMUM GATE TURN-OFF CURRENT VS. RATE-OF-FALL OF GATE TURN-OFF CURRENT



MAXIMUM GATE TRIGGER VOLTAGE, GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE

