

P-Channel Enhancement Mode MOSFET

TDM3607

DESCRIPTION

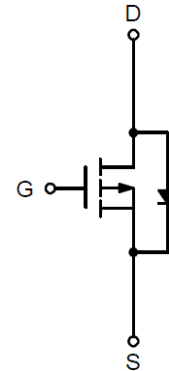
The TDM3607 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

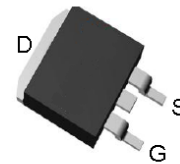
- -60V/-132A
- RDS(ON) < 7.2mΩ @ VGS=-10V
- Reliable and Rugged
- Lead free product is available
- TO263 Package

Application

- PWM applications
- Load switch
- Power management



P-Channel MOSFET



Top View of TO-263-3

ABSOLUTE MAXIMUM RATINGS(T_A=25°C unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V _{DS}	-60	V
Gate-Source Voltage	V _{GS}	±25	V
Diode Continuous Forward Current	I _S	-80	A
Pulse Drain Current Tested	I _{DP} (T _C =25°C)	-264	A
Continuous Drain Current	I _D (T _C =25°C)	-132 <small>note1</small>	A
	I _D (T _C =100°C)	-83	A
Maximum Power Dissipation	P _D (T _C =25°C)	250	W
	P _D (T _C =100°C)	100	W
Thermal Resistance-Junction to Ambient	R _{θJA}	50	°C/W
Thermal Resistance-Junction to Case	R _{θJC}	0.5	°C/W

NOTES:

1. Max continuous current is limited by bonding wire.

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

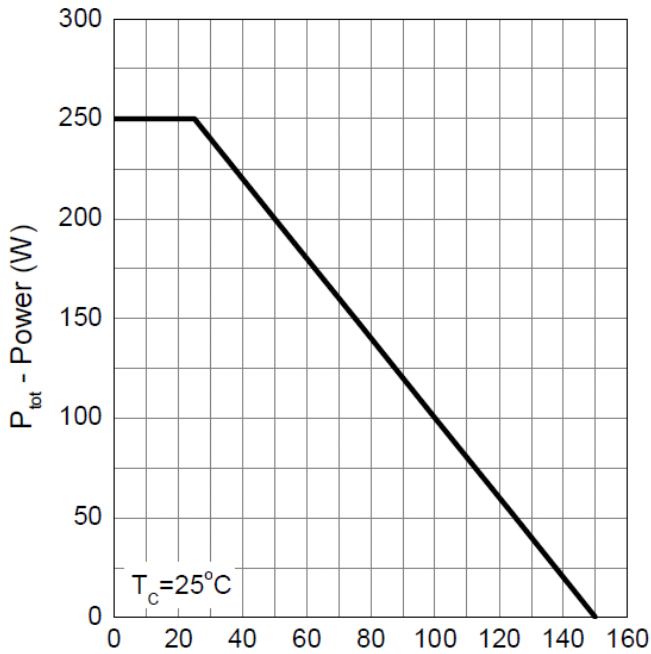
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
STATIC CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-48V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 25V, V_{DS}=0V$	-	-	± 100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-	-3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_{DS}=-20A$	-	5.6	7.2	m Ω
DYNAMIC CHARACTERISTICS (Note 3)						
Input Capacitance	C_{iss}	$V_{DS}=-30V, V_{GS}=0V, F=1.0\text{MHz}$	-	6095	-	PF
Output Capacitance	C_{oss}		-	1080	-	PF
Reverse Transfer Capacitance	C_{rss}		-	430	-	PF
SWITCHING CHARACTERISTICS (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-30V, R_L=30\Omega, V_{GEN}=-10V, R_G=6\Omega, I_{DS}=-1A$	-	18	33	nS
Turn-on Rise Time	t_r		-	20	36	nS
Turn-Off Delay Time	$t_{d(off)}$		-	200	360	nS
Turn-Off Fall Time	t_f		-	120	216	nS
Total Gate Charge	Q_g	$V_{DS}=-30V, I_{DS}=-20A, V_{GS}=-10V$	-	136	-	nC
Gate-Source Charge	Q_{gs}		-	20	-	nC
Gate-Drain Charge	Q_{gd}		-	33	-	nC
Body Diode Reverse Recovery Time	T_{rr}	$I_{DS}=-20A, di/dt=100A/\mu s$	-	51	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	90	-	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 2)	V_{SD}	$V_{GS}=0V, I_{SD}=-1A$	-	-0.7	-1	V

NOTES:

- Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing

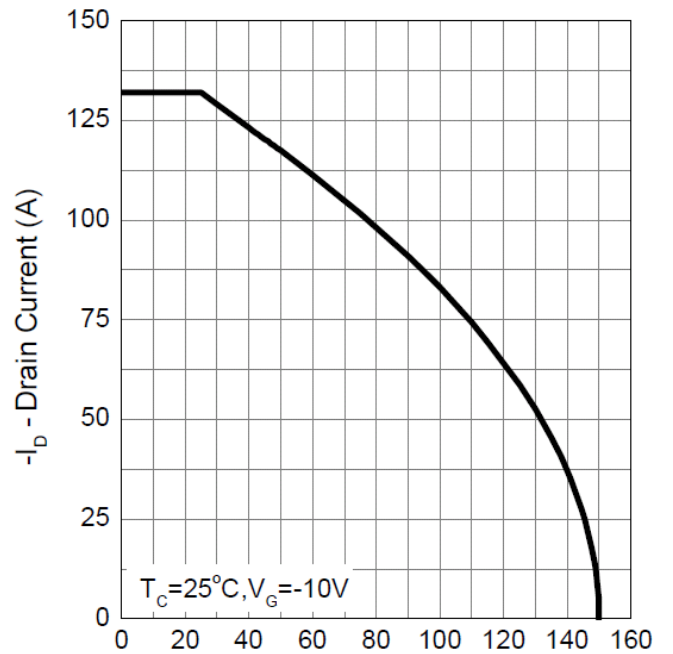
Typical Operating Characteristics

Power Dissipation



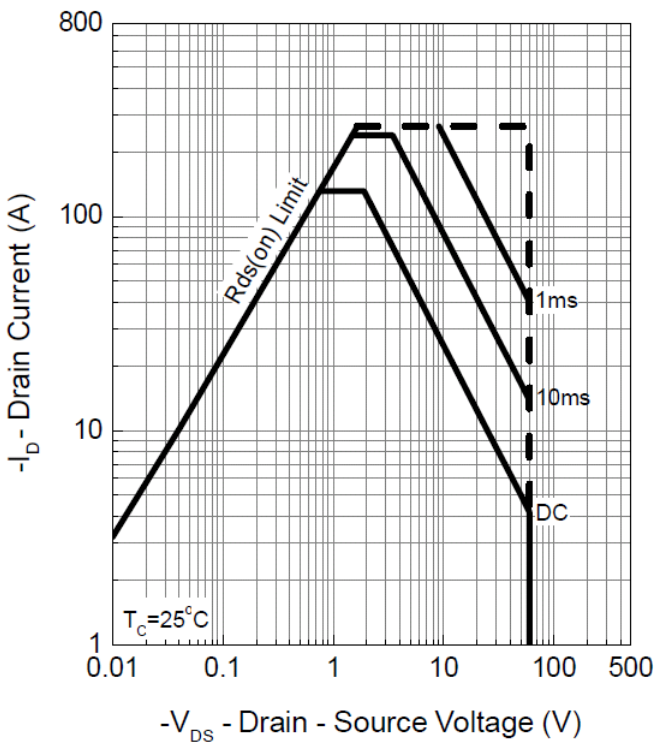
T_j - Junction Temperature ($^\circ C$)

Drain Current

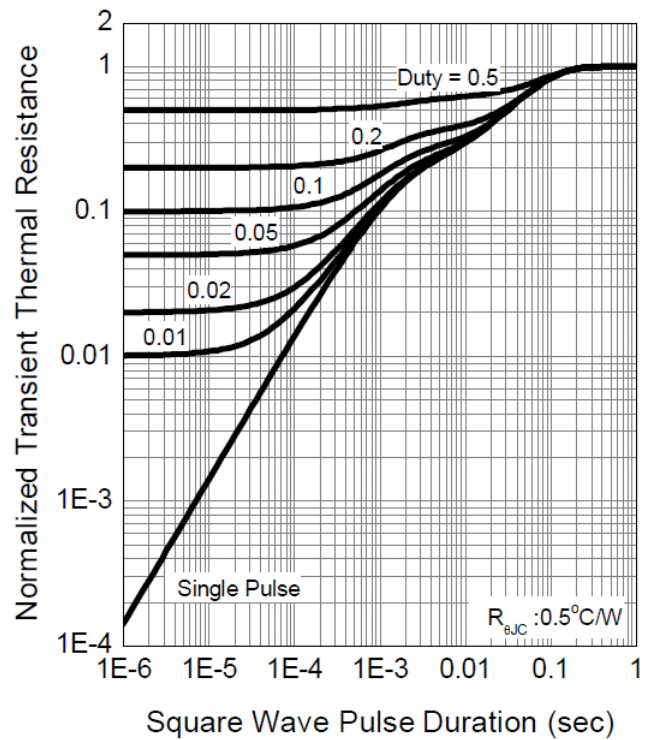


T_j - Junction Temperature ($^\circ C$)

Safe Operation Area



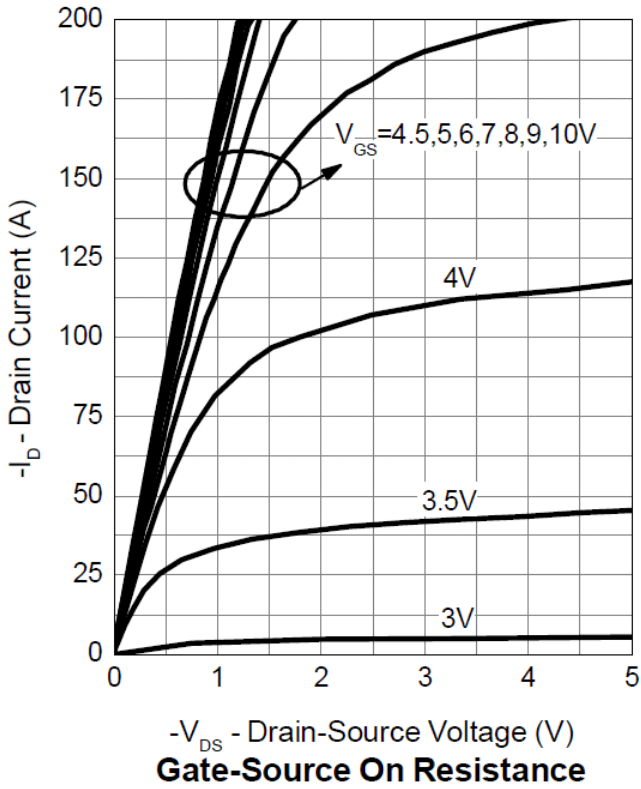
Thermal Transient Impedance



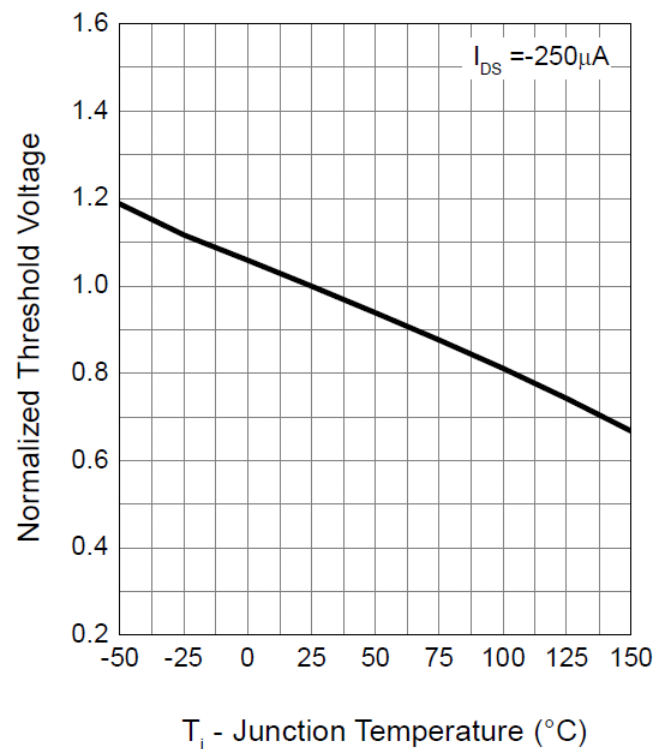
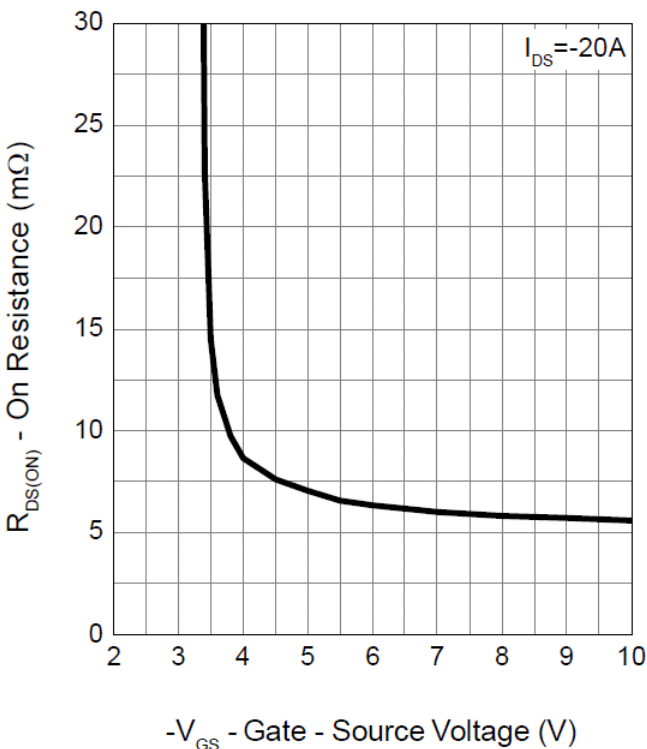
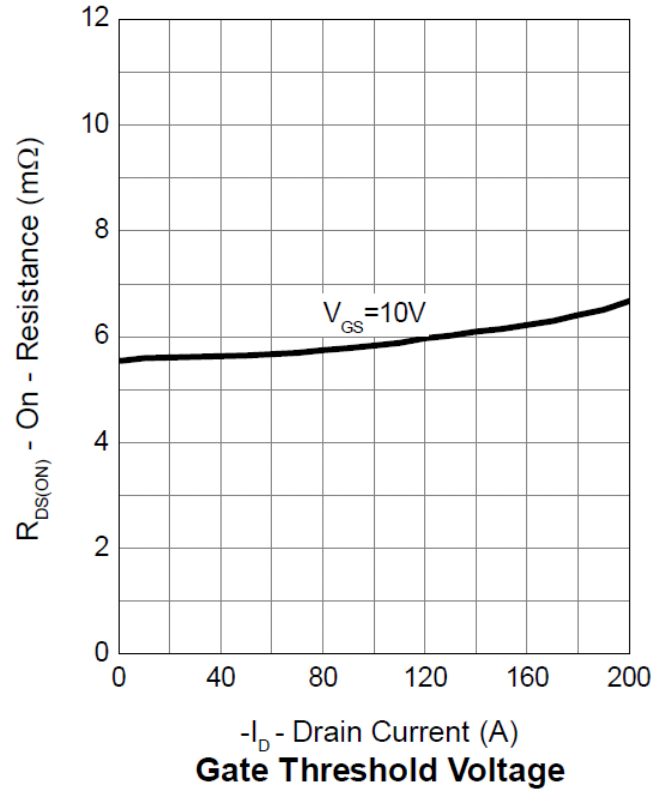
P-Channel Enhancement Mode MOSFET TDM3607

Typical Operating Characteristics(Cont.)

Output Characteristics



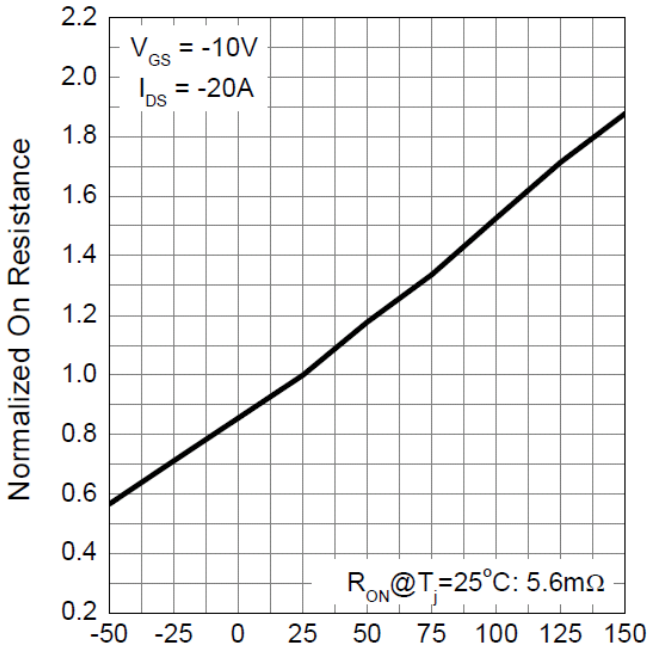
Drain-Source On Resistance



P-Channel Enhancement Mode MOSFET TDM3607

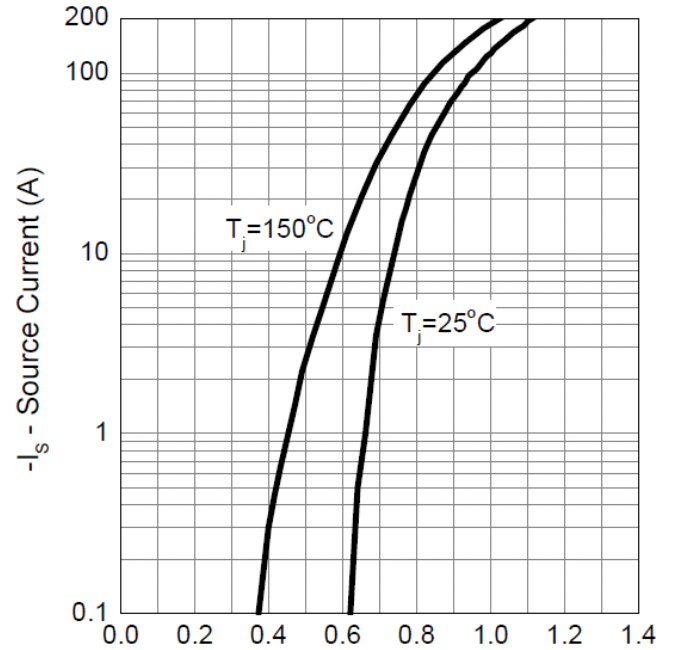
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance



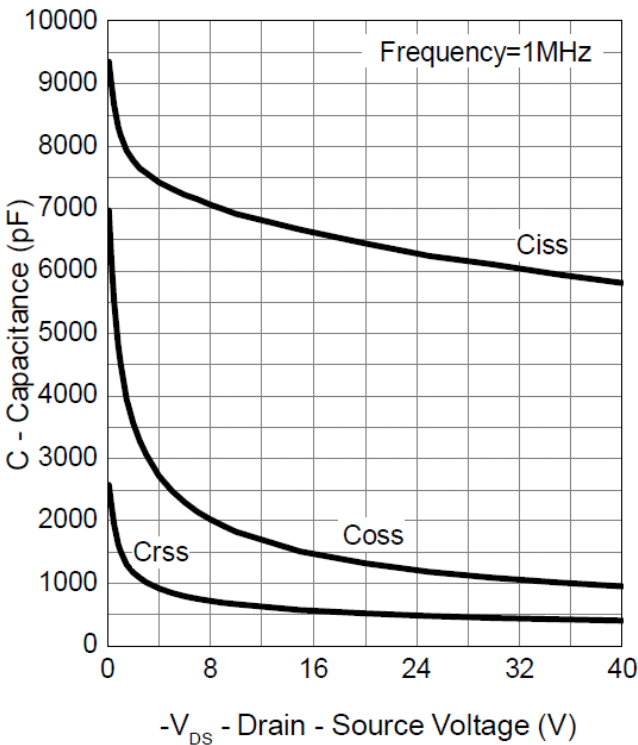
T_j - Junction Temperature ($^{\circ}\text{C}$)

Source-Drain Diode Forward



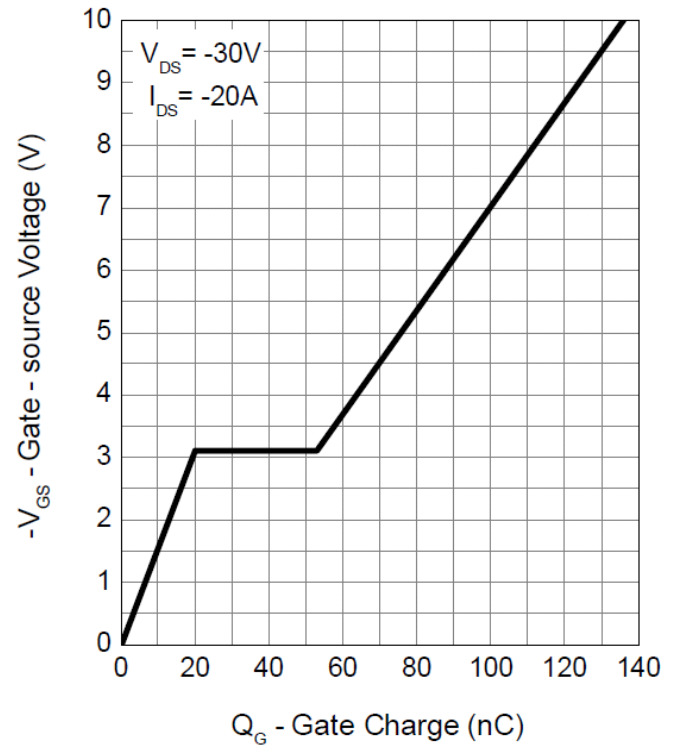
$-V_{SD}$ - Source - Drain Voltage (V)

Capacitance



$-V_{DS}$ - Drain - Source Voltage (V)

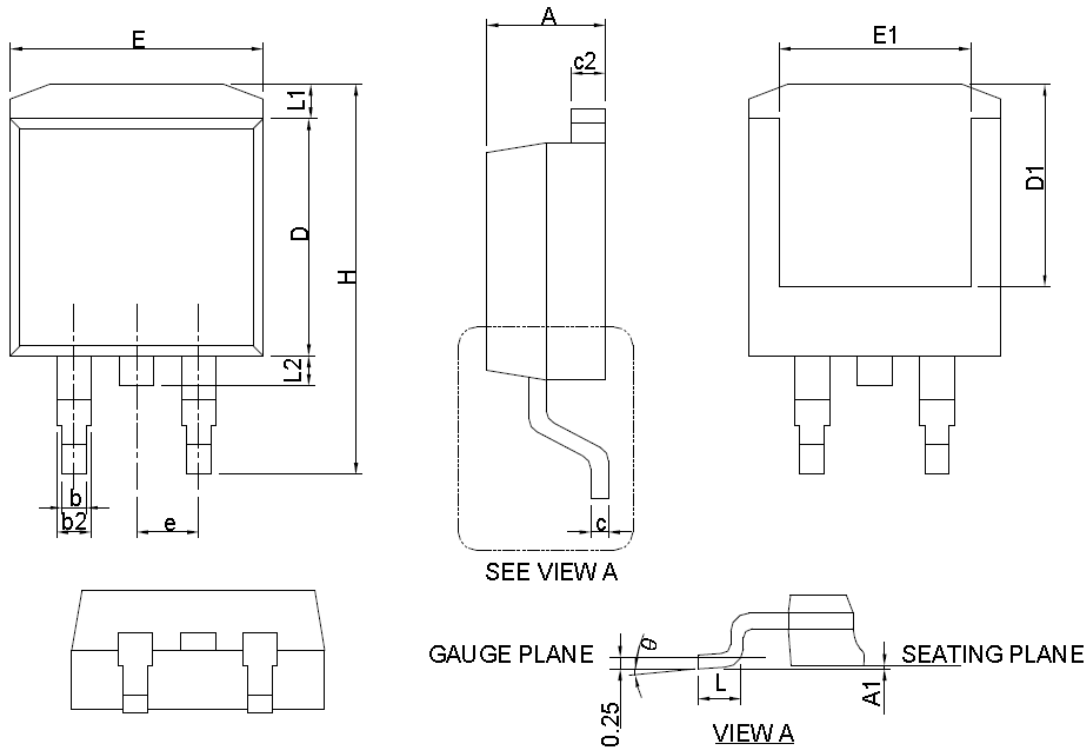
Gate Charge



Q_G - Gate Charge (nC)

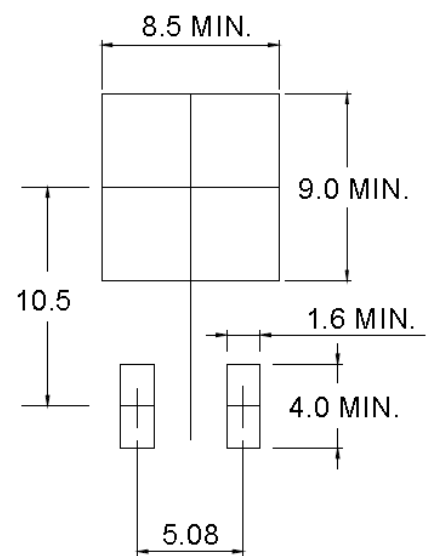
Package Information

TO-263 Package



SYMBOL	TO-263-3			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b2	1.14	1.78	0.045	0.070
c	0.38	0.74	0.015	0.029
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380
D1	6.00	9.00	0.236	0.354
E	9.65	11.43	0.380	0.450
E1	6.22	9.00	0.245	0.354
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.68	-	0.066
L2	-	1.78	-	0.070
θ	0°	8°	0°	8°

RECOMMENDED LAND PATTERN



UNIT: mm

Note : Follow JEDEC TO-263 AB.

Design Notes