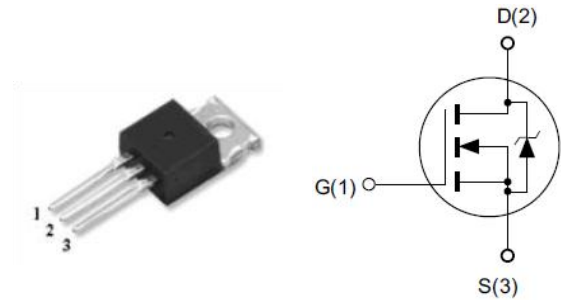


Features

- ◆ 40V, 190A, $R_{DS(on)}$ (Typ.) = 3.3mΩ@ $V_{GS} = 10V$
- ◆ Excellent $R_{DS(on)}$ and Low Gate Charge
- ◆ Halogen-free; RoHS-compliant
- ◆ 100% E_{AS} Guaranteed

Application

- ◆ Load Switch
- ◆ PWM Application
- ◆ Power Management



Absolute Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage ^a		40	V
V_{GS}	Gate-Source Voltage		±25	
I_D	Drain Current-Continuous	$T_C = 25^\circ\text{C}$	190	A
		$T_C = 100^\circ\text{C}$	134	
I_{DM}	Drain Current-Pulsed ^b		760	
P_D	Maximum Power Dissipation, $T_C = 25^\circ\text{C}$		313	W
E_{AS}	Single Pulsed Avalanche Energy ^c		484	mJ
T_J, T_{STG}	Operating and Store Temperature Range		150, -55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.4	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	50	

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 40V, V_{GS} = 0V$	-	-	1.0	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 25V$	-	-	±100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V, I_D = 30A$	-	3.3	4.0	mΩ

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	$V_{DS} = V_{GS} = 0V, f = 1.0MHz$	-	1.0	-	Ω
C_{iss}	Input Capacitance	$V_{DS} = 20V, V_{GS} = 0V, f = 1.0MHz$	-	9516	-	pF
C_{oss}	Output Capacitance		-	962	-	
C_{rss}	Reverse Transfer Capacitance		-	570	-	

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 20V, V_{GS} = 10V, I_D = 30A, R_{GEN} = 2.7\Omega$	-	26	-	ns
t_r	Turn-On Rise Time		-	30	-	
$t_{d(off)}$	Turn-Off Delay Time		-	59	-	
t_f	Turn-Off Fall Time		-	19	-	
Q_g	Total Gate Charge	$V_{DS} = 20V, V_{GS} = 0 \text{ to } 10V, I_D = 30A$	-	147	-	nC
Q_{gs}	Gate-Source Charge		-	50	-	
Q_{gd}	Gate-Drain Charge		-	31	-	

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_G = V_D = 0V, \text{ Force Current}$	-	-	190	A
I_{SM}	Maximum Pulsed Current		-	-	760	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 30A$	-	-	1.2	V
T_{rr}	Body Diode Reverse Recovery Time	$I_F = 30A, di_F/dt = 100A/\mu s$	-	33	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F = 30A, di_F/dt = 100A/\mu s$	-	29	-	nC

Notes:

- $T_J = +25^\circ C \text{ to } +150^\circ C$.
- Repetitive rating: pulse width limited by maximum junction temperature.
- $L = 0.5mH, V_{DD} = 25V, I_{AS} = 44A, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

Characteristic Curve

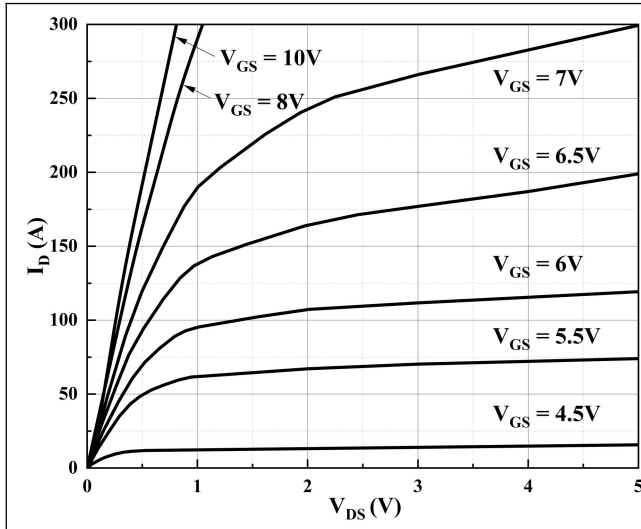


Figure 1. Typical Output Characteristics

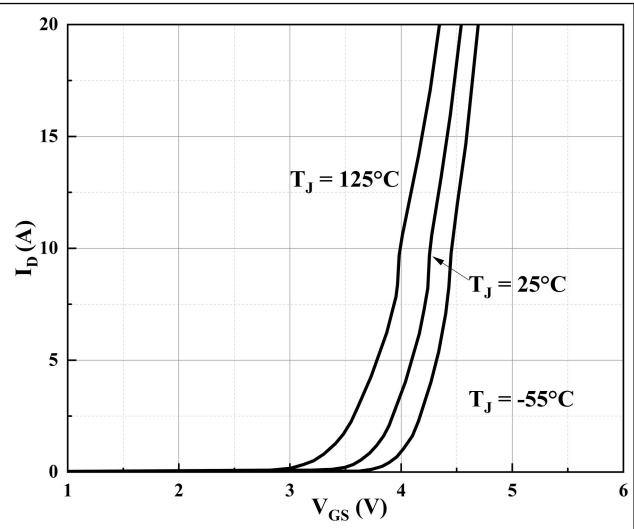


Figure 2. Typical Transfer Characteristics

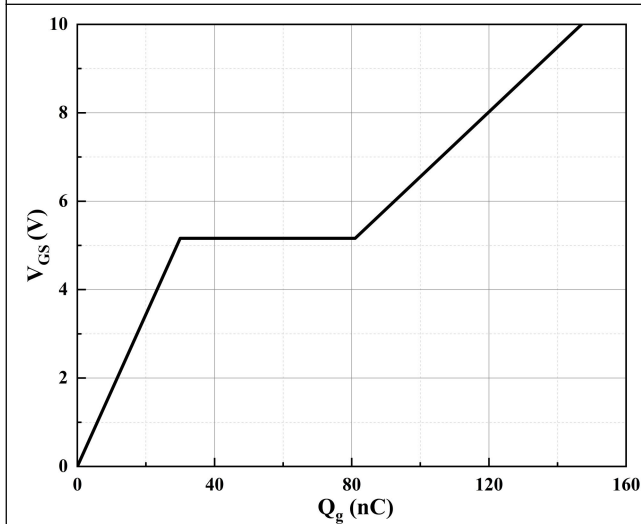


Figure 3. Typical Gate Charge

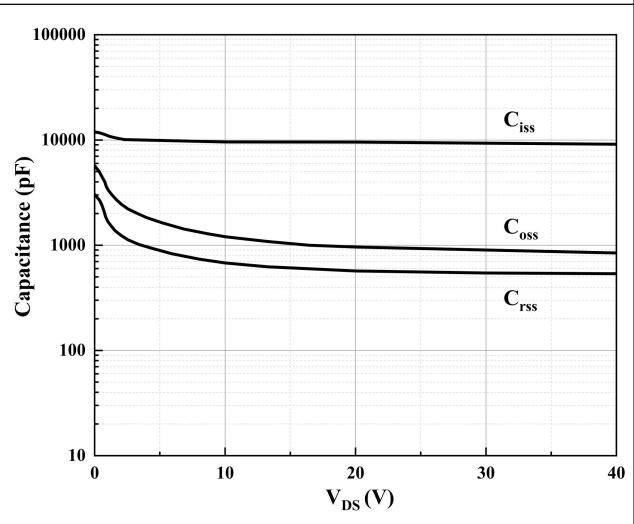


Figure 4. Typical Capacitance

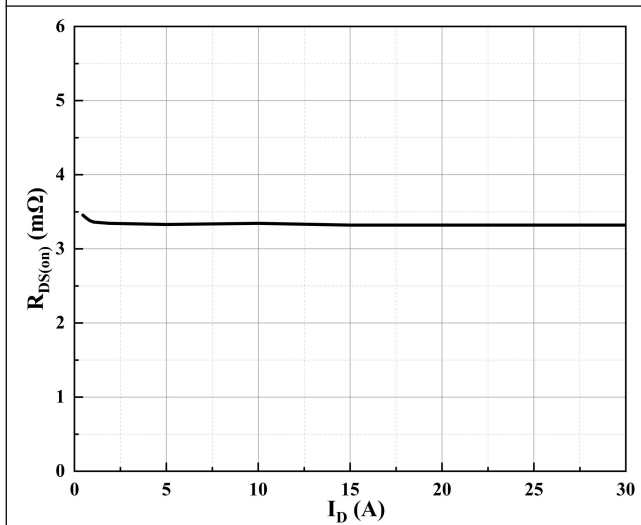


Figure 5. Static Drain-Source On-Resistance vs. Drain Current

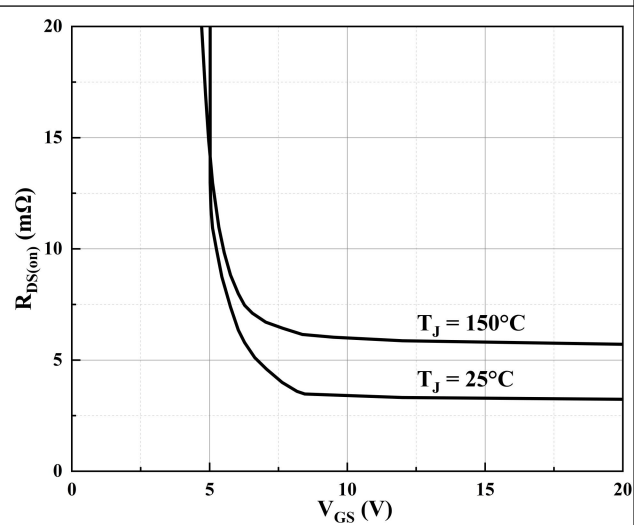


Figure 6. Static Drain-Source On-Resistance vs. Gate-Source Voltage

■ Characteristic Curve

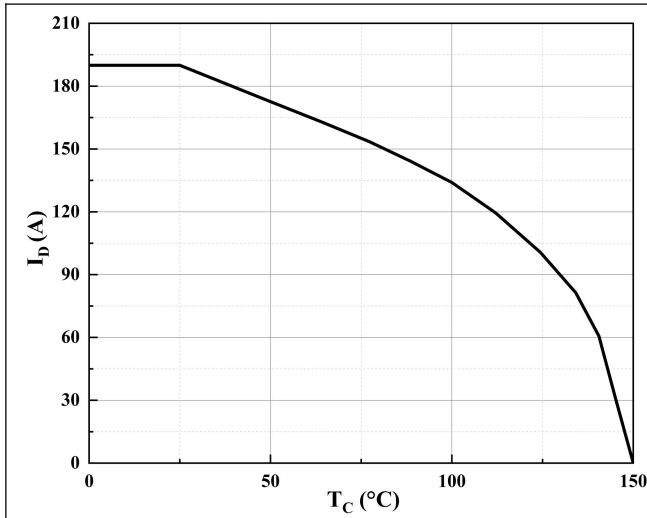


Figure 7. Maximum Continuous Drain Current vs. Case Temperature

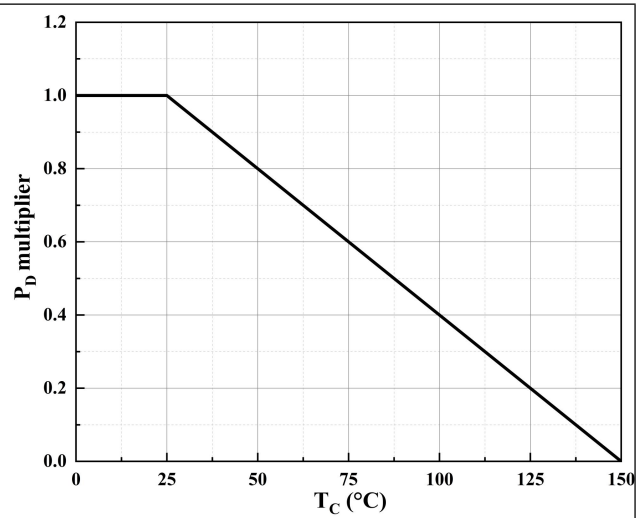


Figure 8. Maximum Power Dissipation multiplier vs. Case Temperature

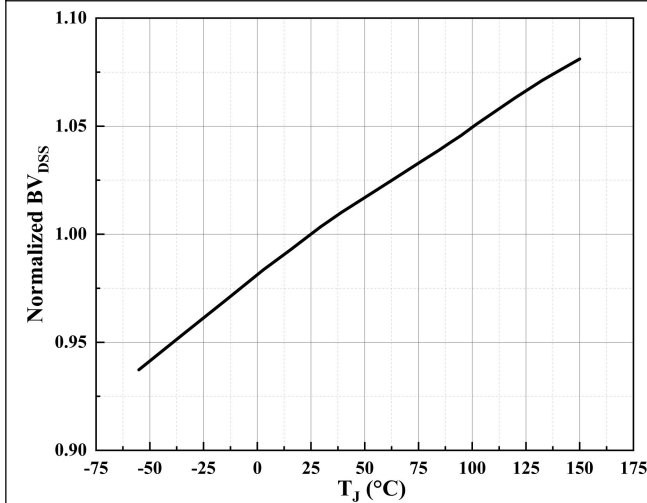


Figure 9. Normalized Drain-Source Breakdown Voltage vs. Junction Temperature

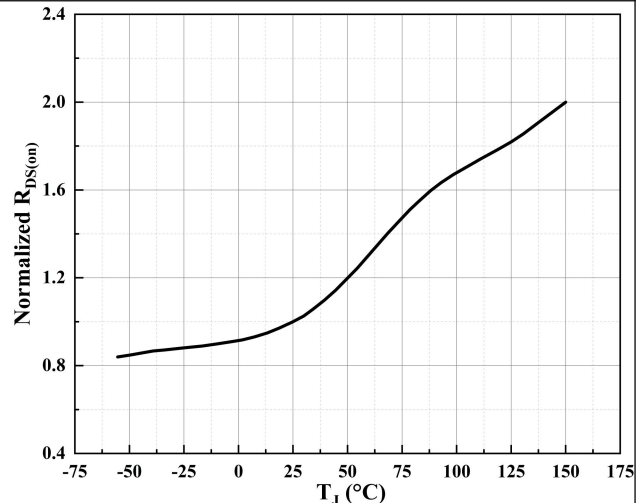


Figure 10. Normalized Static Drain-Source On-Resistance vs. Junction Temperature

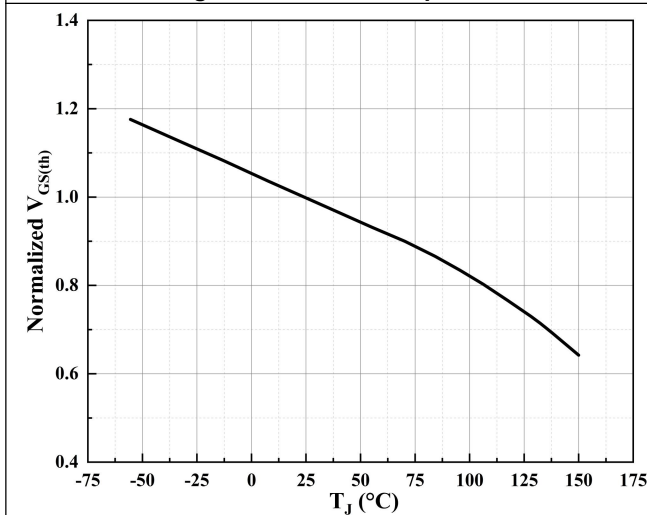


Figure 11. Normalized Gate Threshold Voltage vs. Junction Temperature

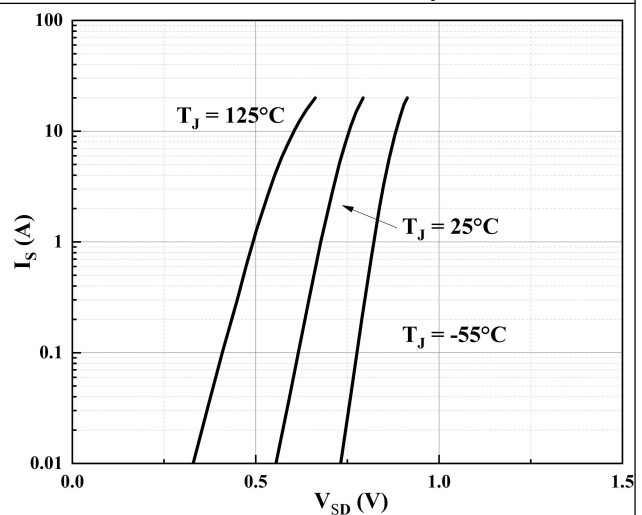
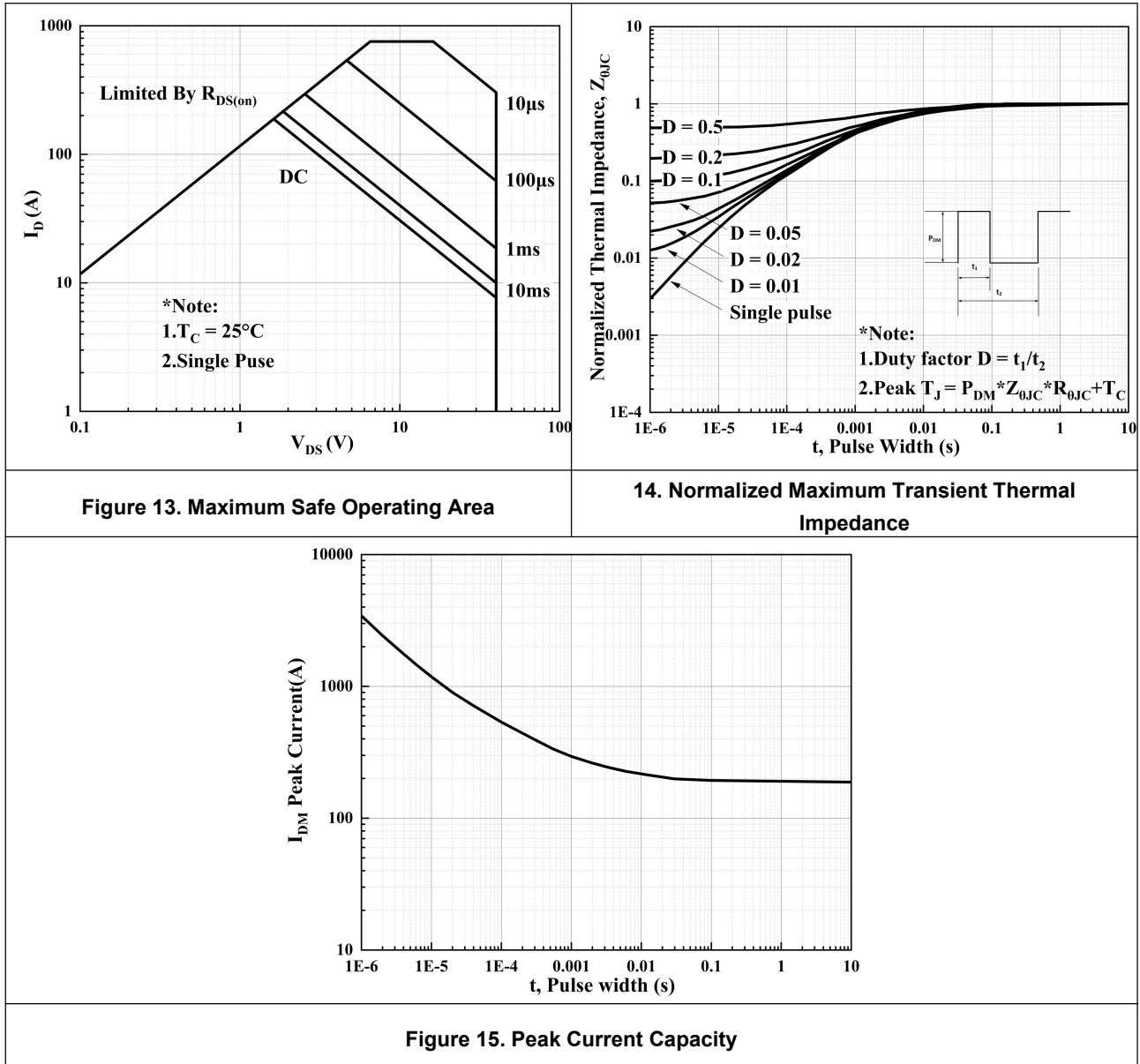


Figure 12. Body Diode Characteristics

■ Characteristic Curve



■ Package Information

TO-220

