

PRODUCT CHARACTERISTICS

V_{DS}	100V
$V_{GS(th_Typ)}$	3.2V
$R_{DS(ON_Typ)} (@ V_{GS} = 10V)$	4.7m Ω
I_D	120A

FEATURES

- * Ultra-low $R_{DS(ON)}$
- * Low Gate Charge
- * 100% UIS Tested, 100% R_g Tested
- * Pb-free Lead Plating
- * Halogen-free and RoHS-compliant

APPLICATIONS

- * Power Management in Telecom., Industrial Automation, CE
- * Current Switching in DC/DC (BMS, Buck/Boost, PoL) & AC/DC (SR)
- * Motor Driving in Power Tool, E-vehicle, Robotics

ORDER INFORMATION

ORDER CODES		Package	Packing
Halogen-free	Halogen		
N/A	MOT8156D	TO-252	2500piece/Reel

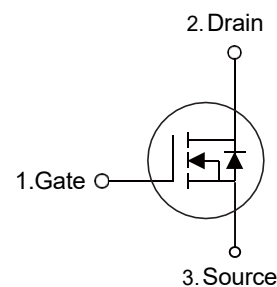
ABSOLUTE MAXIMUM RATINGS (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-to-Source		V_{DS}	100	V
Gate-to-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current (@ $V_{GS}=10V$)	$T_C = 25^\circ\text{C}$	I_D	120	A
	$T_C = 100^\circ\text{C}$		76	A
Pulsed Drain Current		I_{DM}	480	A
Avalanche Current		I_{AS}	32	A
Avalanche Energy		E_{AS}	154	mJ
Power Dissipation		P_D	104	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	1.2	$^\circ\text{C/W}$

Note: * EAS condition: $T_J=25^\circ\text{C}$, $V_{DS}=100V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$



ELECTRICAL CHARACTERISTICS (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static parameter						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1.0	μA
		$T_J = 55^{\circ}C$	-	-	5.0	
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.2	4.0	V
Static Drain-Source ON-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	4.7	6.5	m Ω
Dynamic parameter						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 20V, f = 1MHz$	-	3900	-	pF
Output Capacitance	C_{oss}		-	2200	-	pF
Reverse Transfer Capacitance	C_{rss}		-	211	-	pF
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$	-	1.8	-	Ω
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 5A$	-	20	-	S
Switching parameter						
Total Gate Charge (@ $V_{GS} = 10V$)	Q_g	$V_{GS} = 0 \text{ to } 10V$ $V_{DS} = 50V, I_D = 20A$	-	42	-	nC
Total Gate Charge (@ $V_{GS} = 6.0V$)	Q_g		-	28	-	nC
Gate Source Charge	Q_{gs}		-	9.7	-	nC
Gate Drain Charge	Q_{gd}		-	10.6	-	nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10V, V_{DS} = 50V$ $R_L = 2.5\Omega, R_{GEN} = 6\Omega$	-	13	-	ns
Turn-On Rise Time	t_r		-	25	-	ns
Turn-Off DelayTime	$t_{D(off)}$		-	43	-	ns
Turn-Off Fall Time	t_f		-	37	-	ns
Source-Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	$I_{SD} = 1A, V_{GS} = 0V$	-	0.70	1.0	V
Diode Continuous Current	I_S		-	-	120	A
Maximum Pulsed Current	I_{SM}		-	-	480	A
Body Diode Reverse Recovery Time	t_{rr}	$I_{SD} = 15A, dI/dt = 100A/\mu s$	-	60	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_{SD} = 15A, dI/dt = 100A/\mu s$	-	61	-	nC

■ TYPICAL CHARACTERISTICS

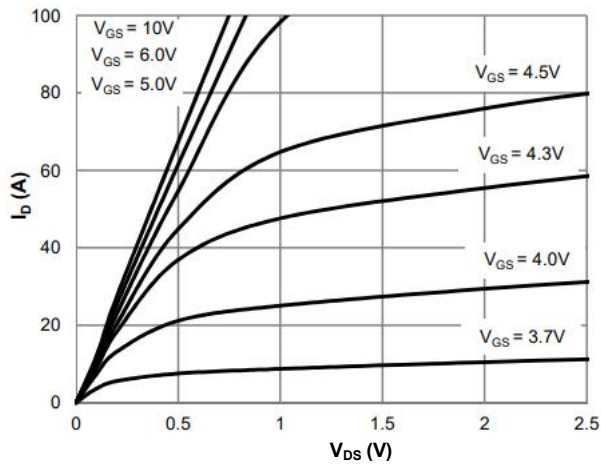


Figure 1: Saturation Characteristics

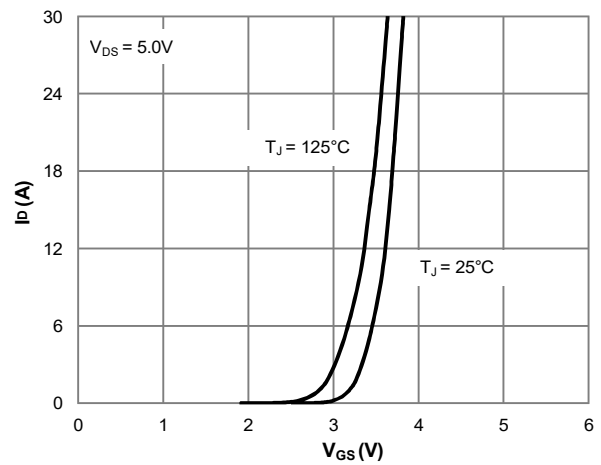


Figure 2: Transfer Characteristics

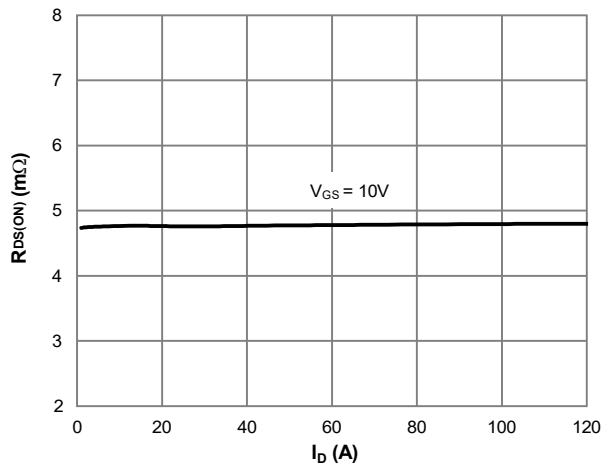


Figure 3: $R_{DS(ON)}$ vs. Drain Current

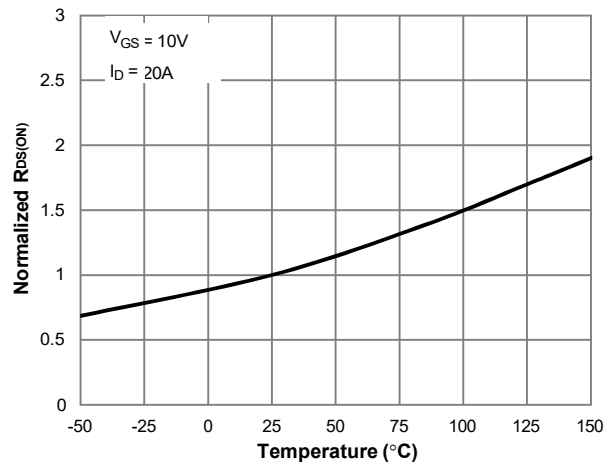


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

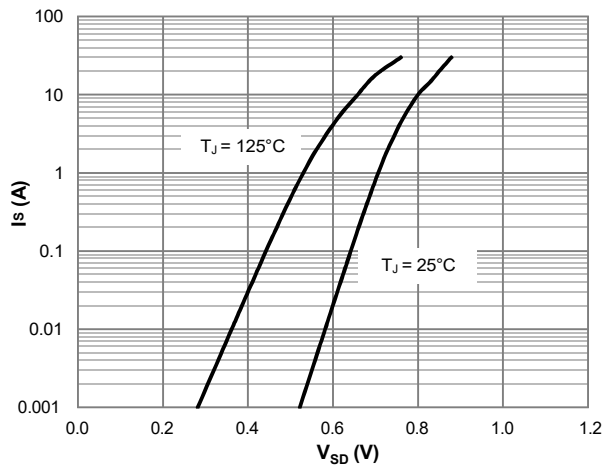


Figure 5: Body-Diode Characteristics

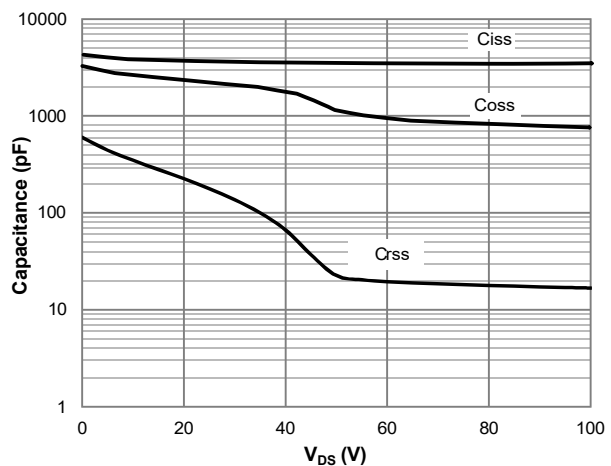


Figure 6: Capacitance Characteristics

■ TYPICAL CHARACTERISTICS(Cont.)

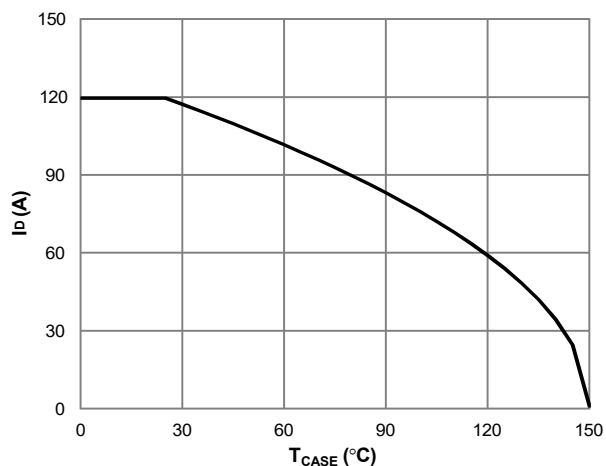


Figure 7: Current De-rating

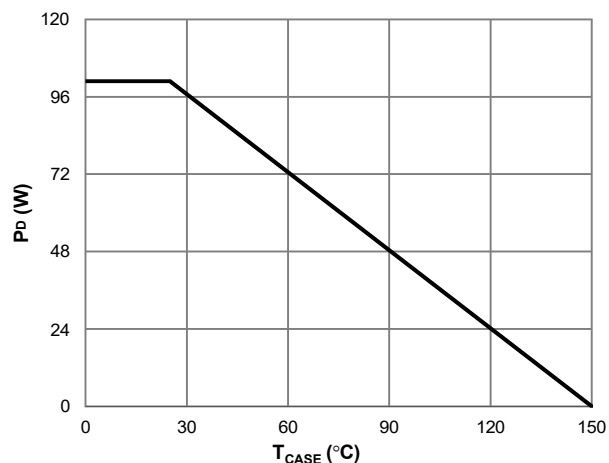


Figure 8: Power De-rating

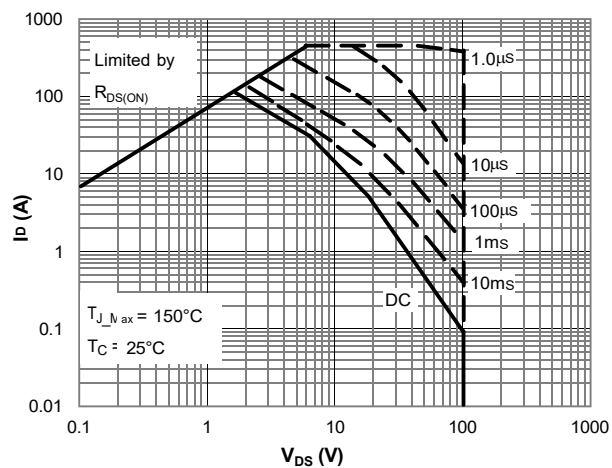


Figure 9: Maximum Safe Operating

