

■ PRODUCT CHARACTERISTICS

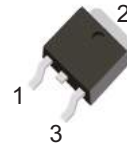
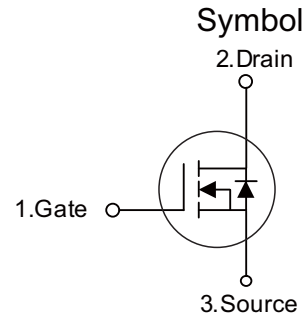
VDSS	30V
$R_{DS(on)typ}(@V_{GS}=10V)$	5.5mΩ
$R_{DS(on)typ}(@V_{GS}=4.5V)$	8mΩ
ID	70A

■ APPLICATIONS

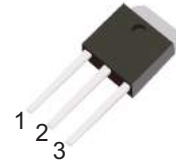
- \* Switching applications

■ FEATURES

- \* Low Gate Charge
- \* Simple Drive Requirement
- \* Fast Switching
- \* RoHS Compliant
- \* Pb Free Plating Product



TO-252



TO-251

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT70N03D	TO-252	2500 pieces /Reel
N/A	MOT70N03C	TO-251	70 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS ( $T_c = 25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS}=10V$	$I_D$	70	A
Pulsed Drain Current (Note 1)	$I_{DM}$	195	A
Total Power Dissipation	$P_D$	53	W
Linear Derating Factor	$P_D$	0.36	W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to 175	W/ $^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to 175	W/ $^\circ\text{C}$

■ THERMAL DATA

Parameter	Symbol	Rating	Units
Thermal Resistance Junction-Case	$R_{\theta JC}$	2.8	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction- Ambient	$R_{\theta JA}$	110	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Test Conditions	Limits			Unit
			Min.	Typ.		
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=1\text{mA}$	-	0.032	-	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=33A$	-	5.5	6.6	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	-	8	11.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=33A$	-	35	-	S
$I_{DSS}$	Drain-Source Leakage Current( $T_J=25^\circ\text{C}$ )	$V_{DS}=30V, V_{GS}=0V$	-	-	1	$\mu A$
	Drain-Source Leakage Current( $T_J=175^\circ\text{C}$ )	$V_{DS}=24V, V_{GS}=0V$	-	-	250	
$I_{GSS}$	Gate Source Leakage	$V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
$Q_g$	Total Gate Charge (Note 2)	$I_D=33A$	-	16.5	-	nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=20V$	-	5	-	
$Q_{gd}$	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	10.3	-	
$t_{d(on)}$	Turn-On Delay Time (Note 2)	$V_{DS}=15V$	-	8.2	-	nS
$t_r$	Rise Time	$I_D=33A$	-	105	-	
$t_{d(off)}$	Turn-Off Delay Time	$R_G=3.3\Omega, V_{GS}=10V$	-	21.4	-	
$t_f$	Fall-Time	$R_D=0.45\Omega$	-	8.5	-	
$C_{iss}$	Input Capacitance	$V_{GS}=0V$	-	1485	-	pF
$C_{oss}$	Output Capacitance	$V_{DS}=25V,$	-	245	-	
$C_{rss}$	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	170	-	
$I_S$	Continuous Source Current (Body Diode)	$V_D=V_G=0V, V_S=1.3V$	-	-	60	A
$I_{SM}$	Pulsed Source Current (Body Diode) (Note 1)		-	-	195	A
$V_{SD}$	Forward On Voltage(Note 2)	$T_J=25^\circ\text{C}, I_S=60A,$ $V_{GS}=0V$	-	-	1.3	V

■ TYPICAL CHARACTERISTICS

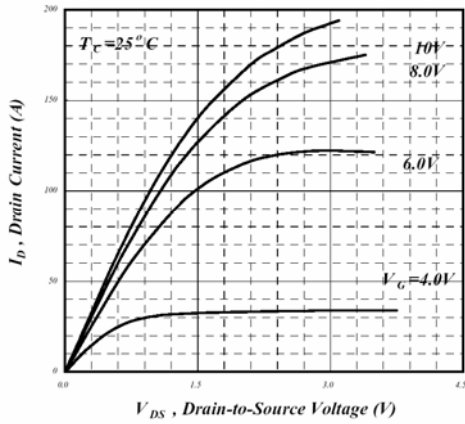


Fig 1. Typical Output Characteristics

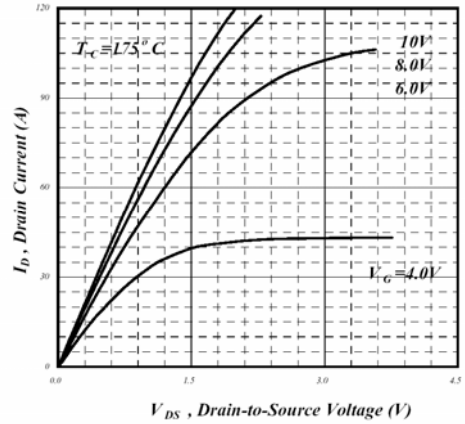


Fig 2. Typical Output Characteristics

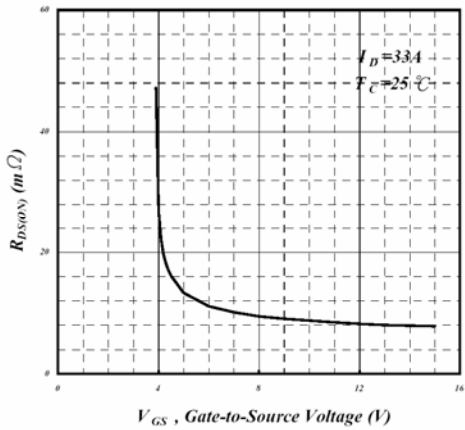


Fig 3. On-Resistance v.s. Gate Voltage

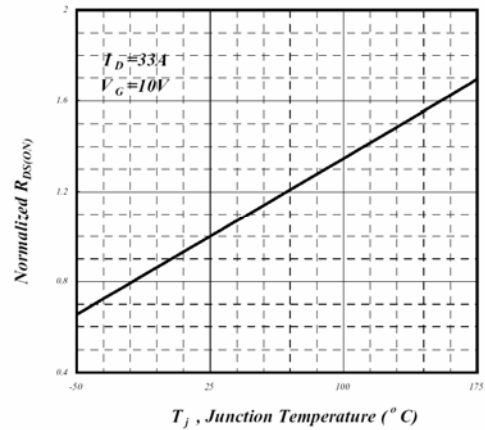


Fig 4. Normalized On-Resistance v.s. Junction Temperature

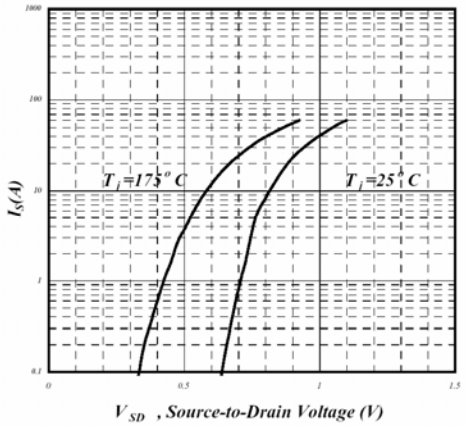


Fig 5. Forward Characteristic of Reverse Diode

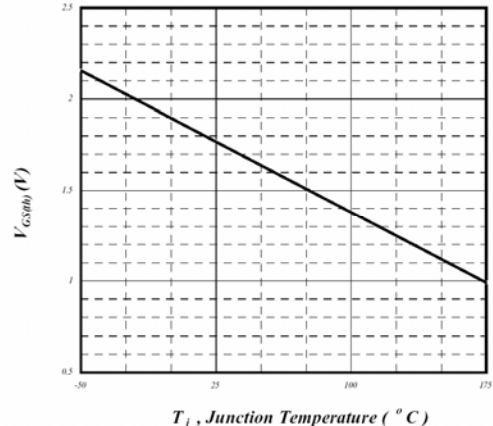


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

■ TYPICAL CHARACTERISTICS(Cont.)

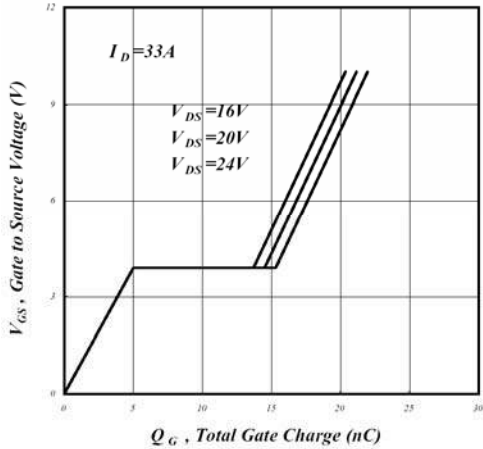


Fig 9. Gate Charge Characteristics

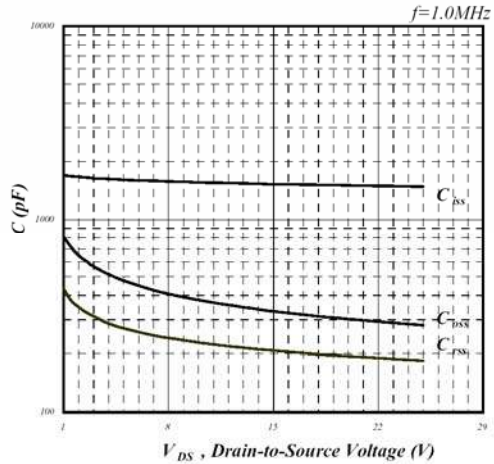


Fig 10. Typical Capacitance Characteristics

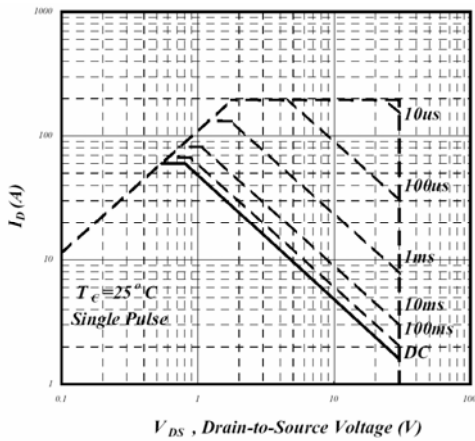


Fig 7. Maximum Safe Operating Area

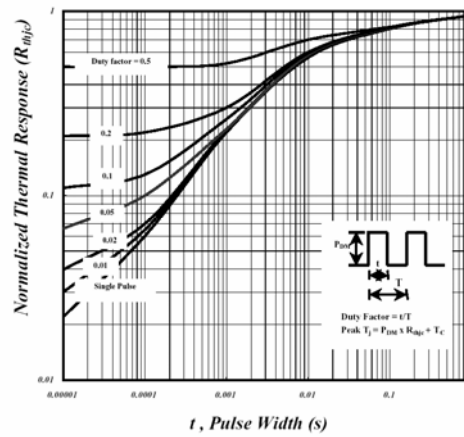


Fig 8. Effective Transient Thermal Impedance

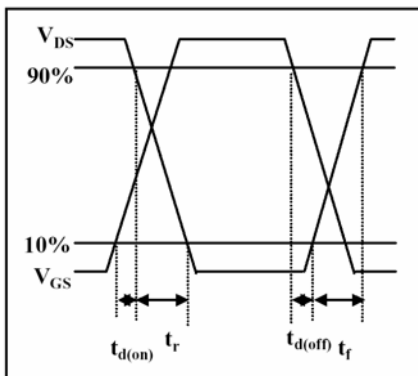


Fig 11. Switching Time Waveform

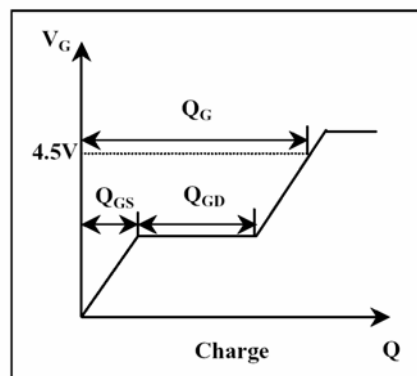
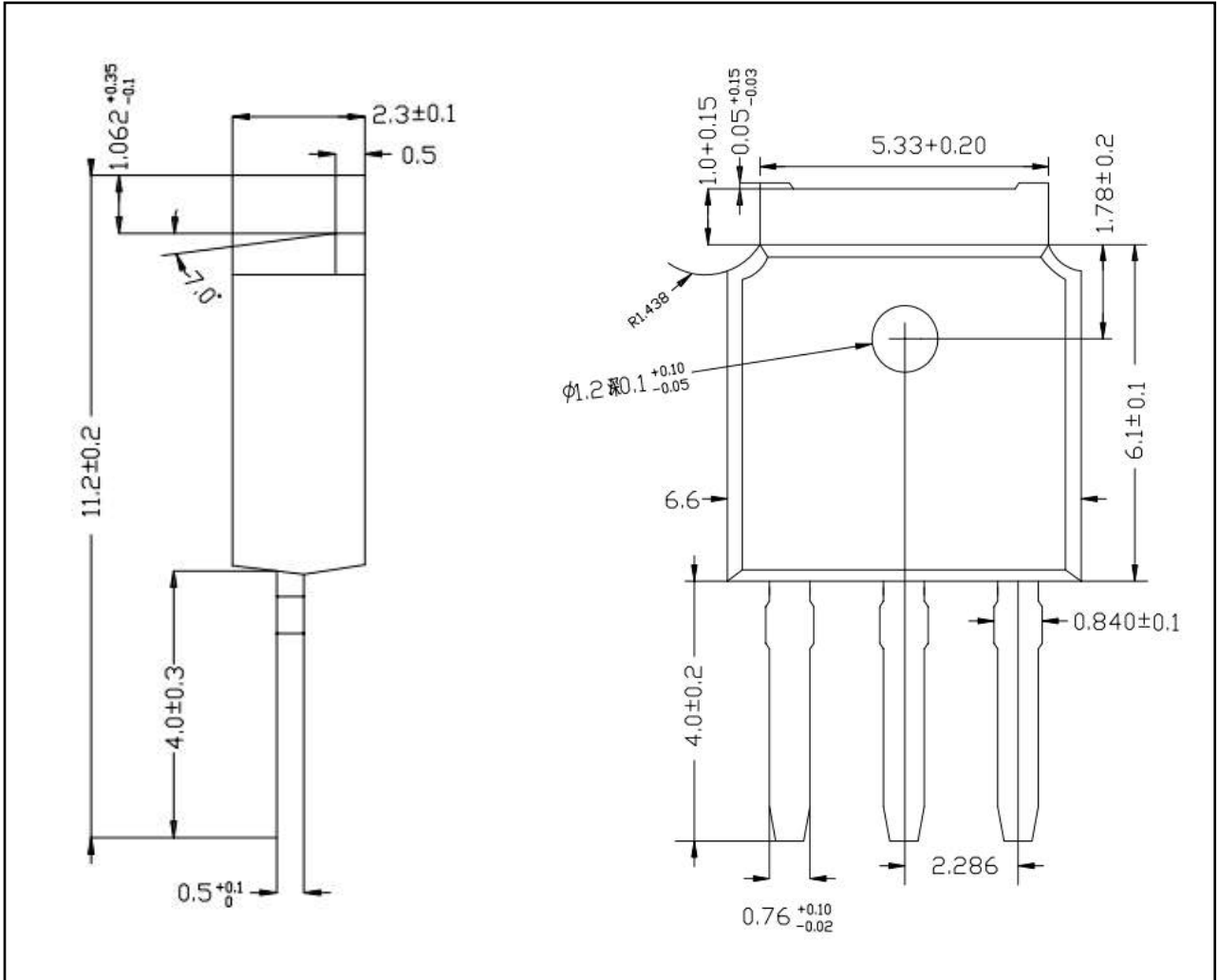


Fig 12. Gate Charge Waveform

■ TO-251PACKAGE OUTLINE DIMENSIONS



■ TO-252 PACKAGE OUTLINE DIMENSIONS

