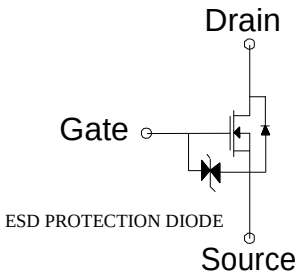
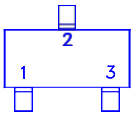
N-Channel High Density Trench MOSFET



SOT-523



1. GATE
2. DRAIN
3. SOURCE

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
60V	2Ω	600mA

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	600	mA
	T_C = 100 °C		380	
Pulsed Drain Current [1]		I_{DM}	1	A
Power Dissipation	T_C = 25 °C	P_D	0.35	W
	T_C = 100 °C		0.14	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-40 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		350	°C / W

[1]Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

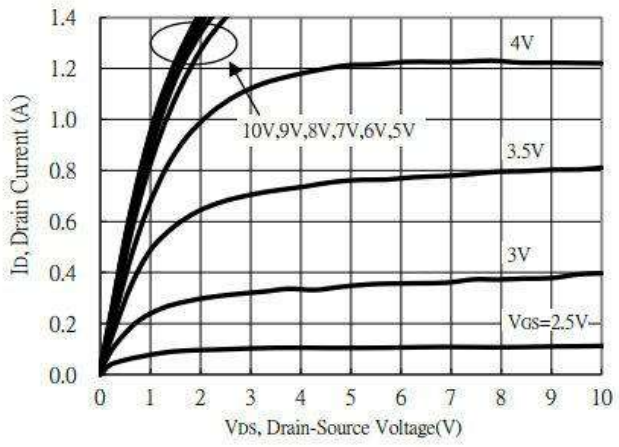
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μ A	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μ A	1	1.5	2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±16V			±30	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	μA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 125 °C			30	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	1			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 3.5V, I_D = 10mA		2.1	5	Ω
		V_{GS} = 4.5V, I_D = 100mA		1.7	3	
		V_{GS} = 10V, I_D = 200mA		1.6	2	
Forward Transconductance[1]	g_{fs}	V_{DS} = 20V, I_D = 200mA		3		S

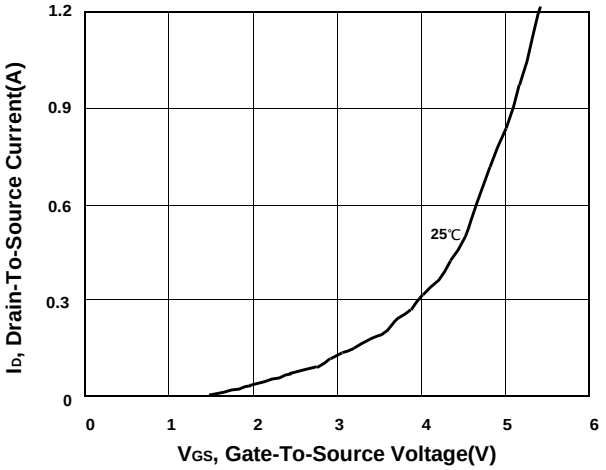
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		42		pF
Output Capacitance	C_{oss}			7		
Reverse Transfer Capacitance	C_{rss}			3		
Total Gate Charge[2]	Q_g	V_{DS} = 30V $_{(BR)DSS}$, V_{GS} = 10V, I_D = 200mA		1.8		nC
Gate-Source Charge[2]	Q_{gs}			0.9		
Gate-Drain Charge[2]	Q_{gd}			0.2		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS(T_J = 25 °C)						
Continuous Current	I_S	I_F =200mA, V_{GS} = 0V			300	mA
Forward Voltage[1]	V_{SD}				1.2	V

[1]Pulse test : Pulse W idth ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.

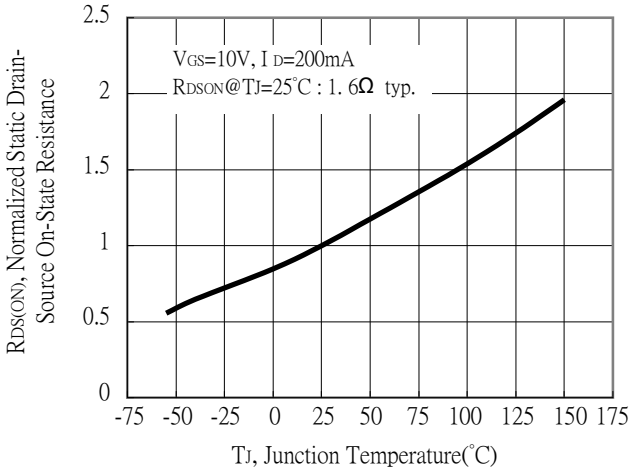
REMARK: ESD Protected Gate, 2KV HBM

Typical Output Characteristics

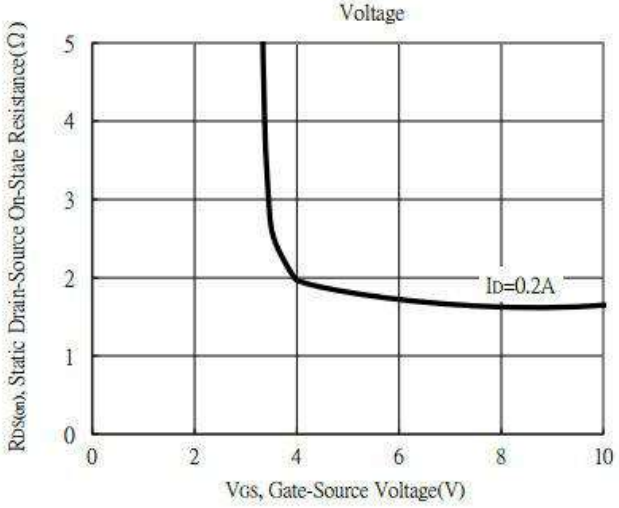


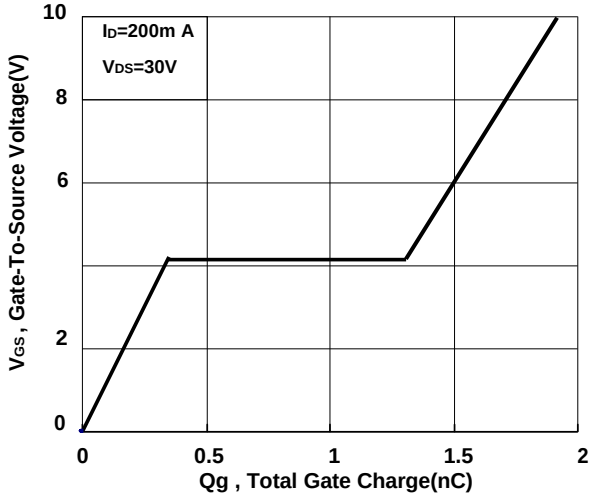


Drain-Source On-State Resistance vs Junction Temperature

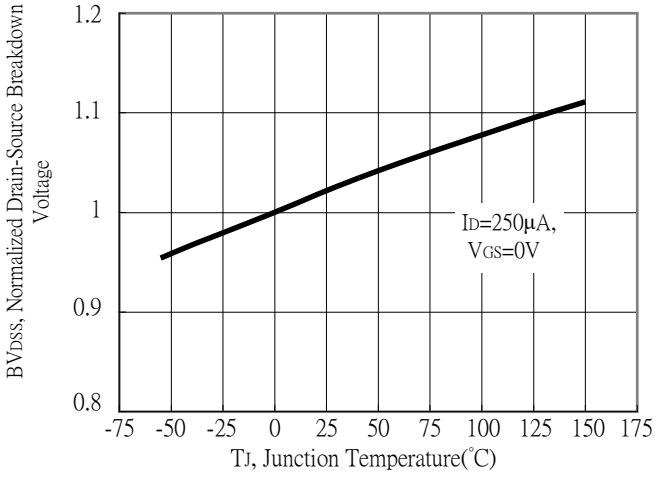


Static Drain-Source On-State Resistance vs Gate-Source Voltage

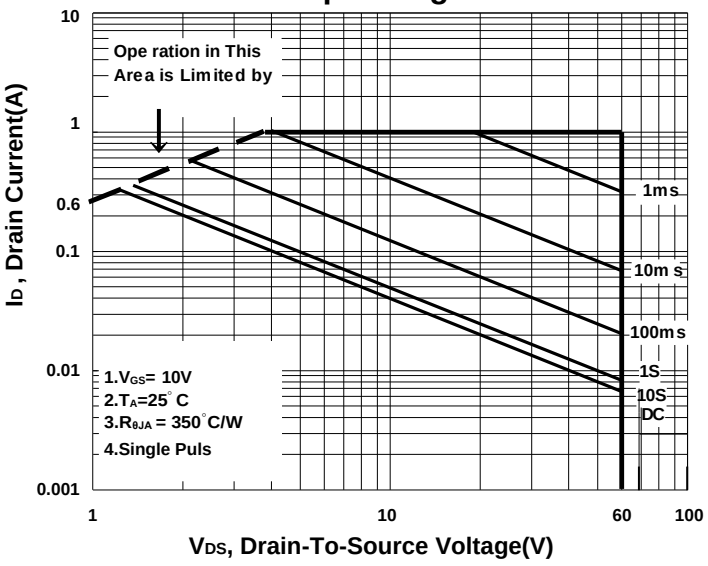




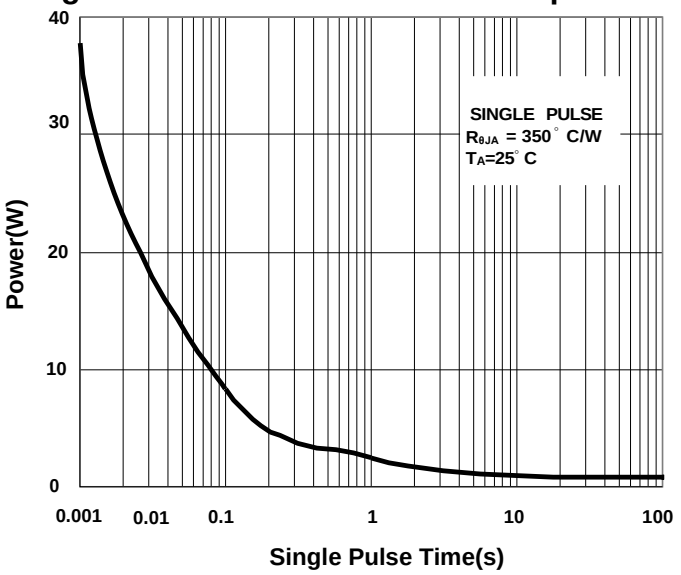
Brekdown Voltage vs Ambient Temperature



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves